APPENDIX J

INLAND RAIL

Terrestrial and Aquatic Ecology Technical Report

PART 2 OF 4

Appendices A to F

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

ARTC

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix A Predicted habitat modelling methodology

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Inland Rail Calvert to Kagaru EIS

Appendix A – Predictive habitat modelling methodology

Australian Rail Track Corporation

Reference: 3400

Contents

1 Introduction 1

1.1 Background 1
1.2 Context 1
1.3 Review of existing databases and literature 1

2 Species included within the predictive habitat mapping model 5
3 Predictive habitat modelling input datasets 7
4 Predictive habitat modelling categories 8

4.1 Matters of national environmental significance migratory species 8
4.1.1 General context 8
4.1.2 Unlikely habitat 8
4.1.3 Potential habitat 8
4.1.4 Important habitat 8
4.2 Species listed under the NC Act 9
4.2.1 General context 9
4.2.2 Unlikely habitat 9
4.2.3 General habitat 9
4.2.4 Essential habitat 9
4.2.5 Core habitat 10

5 Predictive habitat models and general assumptions associated with their development 11

5.1 Flora and fauna habitat models 11

6 References 20
7 Bibliography 21

7.1 Flora species 21
7.2 Fauna species – threatened/special least concern species listed under the NC Act 22
7.2.1 Mammals 22
7.2.2 Birds 22
7.2.3 Amphibian 23
7.3 Fauna species – migratory species listed under the EPBC Act 24
7.3.1 Birds 24

Figures

Figure 5.1 Schematic indicating the relationship between specimen backed records, predicted general habitat, essential habitat and core habitat category designations for species listed under the NC Act

Tables

Table 1.1 Database and document review summary
Table 1.2 Assessments and reports providing ecological information for areas associated with the Project
Table 2.1 Conservation significant flora species identified from database searches
Table 2.2 Conservation significant fauna species identified from database searches
Table 2.3 Migratory fauna species identified from database searches
Table 5.1 EPBC Act listed migratory species habitat assumptions used to map areas of occurrence within ecology study area

Table 5.2 Listed NC Act conservation significant flora species habitat assumptions used to map areas of occurrence within ecology study area
Table 5.3 Listed NC Act conservation significant fauna species habitat assumptions used to map areas of occurrence within the ecology study area

1 Introduction

1.1 Background

For the purposes of the Inland Rail Project (Calvert to Kagaru) (the Project) predictive habitat models for flora and fauna have been prepared. These models have been designed to map the potential areas that are likely to be analogous to habitat associated with *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth (Cth)) (EPBC Act) listed migratory species, and *Nature Conservation Act 1992* (NC Act) listed threatened and near-threatened species. This mapping has the following objective:

- To provide predictive habitat modelling for EPBC Act listed migratory fauna species and NC Act listed threatened and near-threatened flora and fauna species to:
  - Identify areas of potential habitat
  - Facilitate the calculation of potential disturbance areas associated with the Project and to subsequently inform significant adverse residual impacts for matters of national environmental significance (MNES) and matters of state environmental significance (MSES).

This document outlines the methodology used for the development of the predictive habitat models and provides the species/community specific assumptions and mapping requirements required to reproduce the predictive habitat models for each individual species or community. The models have been used to prepare maps indicating the potential extent of each threatened/migratory species associated with the Project as identified in the Project Environmental Impact Statement (EIS) Terms of Reference (ToR), in addition to those species identified from the desktop review phase of the Project EIS.

1.2 Context

For context with respect to the methodology's compliance with EPBC Act Survey Guidelines for threatened species, the more conservative approach of this methodology surpasses the guidelines expectations. The *"How to use these guidelines"* statement includes:

"*… Alternatives to a dedicated survey may also be appropriate. For example, a desktop analysis of historic data may indicate that a significant impact is not likely. Similarly, a regional habitat analysis may be used to determine the importance of a site to the listed birds. Proponents should also consider the proposals impact in the context of the species' national, regional, district and site importance to establish the most effective survey technique(s)…"*

This methodology includes analysis of historic and current data gained from a range of sources (as listed in Table 1.1, with direct and current survey efforts including dedicated ground truthing surveys of the database mapping and follow-up ecological assessments within the ecology study area as part of the projects geotechnical drilling survey program.

1.3 Review of existing databases and literature

Each predictive fauna habitat model has been developed to deliver a process that is robust, transparent and repeatable. The first stage in developing each of the models involved determining the extent of species occurrence and the availability of information pertaining to available species habitat.

Eleven data sources were accessed to identify MNES migratory species and NC Act threatened and near-threatened species that have potential to occur within the ecology study area. These data sources are listed in Table 1.1.

In addition, a total of eight ecological assessments were identified to present the ecological values, including species protected under the NC Act within the ecology study area (refer Table 1.2).

Table 1.1 Database and document review summary

Database/data source name	Database search date	Database search areas	Data type
Atlas of Living Australia	29/03/2020	Disturbance footprint with 50 km buffer applied	Records of flora and fauna, including conservation significant species listed under the EPBC Act and/or NC Act and those identified as MLES.
Flying Fox Monitoring Program	06/02/2020	Ecology study area	Show the general location of flying-fox roosts in Queensland recorded by DES/DAWE and include continuously and periodically (seasonally or irregularly) used roosts. The exact location of roosts may vary within a small localised area.
Flying-fox roost monitoring and locations	24/03/2020	Disturbance footprint with 50 km buffer applied	Show the general location of flying-fox roosts in Queensland recorded by DES and include continuously and periodically (seasonally or irregularly) used roosts. The exact location of roosts may vary within a small localised area.
Birds Australia	23/03/2019	Ecology study area	Records of avian fauna, including threatened and migratory species listed under the EPBC Act and/or NC Act.
BPA mapping (Queensland Government 21/2/2018)	06/02/2020	Ecology study area	State, regional (MSES) and locally (MLES) significant biodiversity matters mapping. This mapping has been used to indicate the location of bioregional corridors (i.e. in the State, regional and local context).
Back on Track species prioritisation framework (DEHP 2010)	06/02/2020	SEQ NRM	The Back on Track species are categorised as Critical, High, Medium, or Low priority for the State and for each NRM region in Queensland. There is also a data deficient category according to three sets of criteria: probability of extinction, consequences of extinction and potential for successful recovery.
EPBC Act Protected Matters Search Tool (Australian Government)	06/02/2020	Ecology study area	Provides a “predictive” account of MNES identified within a specific area. Includes MNES such as world heritage properties, national heritage places or wetlands of international importance and threatened/migratory species.
Groundwater Dependent Ecosystems Atlas (BoM 2019)	06/02/2020	Ecology study area	Provides information related to 3 types of groundwater dependant ecosystems (GDEs): aquatic, terrestrial and subterranean.
Wildlife Habitat Map (Queensland Government 2019)	06/02/2020	Ecology study area	Modelled habitat under the VM Act for a conservation significant species listed under the EPBC Act and/or the NC Act.
Regulated Vegetation Management Map (Queensland Government 2019)	06/02/2020	Ecology study area	Mapping of REs and High Value Regrowth that provide habitat for conservation significant species under the EPBC Act and/or NC Act and may be considered a TEC under EPBC Act.
Register of critical habitat (Australian Government)	06/02/2020	Australian extent	Critical habitat listed under the EPBC Act.
Map of Referable Wetlands (Queensland Government 2018)	06/02/2020	Regional extent	Includes State significant, referable wetlands, important wetlands in the Great Barrier Reef catchments and wetland REs.
Wildnet database (Queensland Government) incorporating WildNet and Herbrecs datasets	06/02/2020	Ecology study area	Records of flora and fauna, including conservation significant species listed under the EPBC Act and/or NC Act and MLES.
Queensland waterways for waterway barrier works (Queensland Government 2018)	06/02/2020	Ecology study area	Waterways where proposed waterway barrier works require assessment and approval under the *Fisheries Act 1994.*

Database/data source name	Database search date	Database search areas	Data type
Watercourse Identification Mapping (Queensland Government 2018)	06/02/2020	Ecology study area	Known extent of watercourses and drainage features that are managed under the *Water Act 2000.*
Wetland Info database (DES 2019)	06/02/2020	Impact assessment area	Provides interactive maps, species records, case studies and legislation associated with Queensland wetlands. Also provides access to Queensland AquaBAMM assessments.
Fish Habitat Areas (Queensland Government 2018)	06/02/2020	Ecology study area	Boundaries of gazetted, declared fish habitat areas.
Queensland Springs Database (Queensland Government 2018)	06/02/2020	Regional extent	The dataset provides a comprehensive catalogue of permanently saturated springs that have fixed locations and any associated surface expression GDEs.
Matters of State Environmental Significance (Queensland Government)	06/02/2020	Ecology study area	Location of MSES including: ■ Protected areas ■ Marine parks ■ Management A and Management B declared FHAs ■ Threatened and special least concern wildlife listed under the NC Act ■ Regulated vegetation under the VM Act ■ Wetlands in a wetland protection area or wetlands of high ecological significance ■ Wetlands and watercourses in high ecological value waters as defined in the Environmental Protection (Water) Policy 2009, Schedule 2 ■ Legally secured offset areas.

Table 1.2 Assessments and reports providing ecological information for areas associated with the Project

Document title	Reference	Summary of significant findings related to MNES
Southern Freight Rail Corridor Study (March 2010)	AECOM (2010)	■ Confirmation of the presence of the Swamp tea-tree (*Melaleuca irbyana*) during field investigations ■ Detection of the Powerful owl (Ninox strenua) during nocturnal call-playback ■ Analysis and conformation of Remnant vegetation as listed under the VM Act within the study area.
Calvert to Kagaru Flora and Fauna Technical Report	Jacobs-GHD (2016)	■ Confirmation of the presence of the Swamp tea-tree (*Melaleuca irbyana*) during field investigations ■ Observations of feeding signs (i.e. orts) of Glossy black-cockatoos (Calyptorhynchus lathami) during field investigations
Australian Rail Track Corporation/Transport - Land/southwest of Ipswich/Queensland/Inland Rail Calvert to Kagaru Project (EPBC Referral number 2017/7944)	ARTC (2017)	■ Provides initial details on how the project is likely to impact upon MSES. This includes, identification of potential impacts to threatened species, remnant vegetation and migratory species.
Initial Advice Statement: Inland Rail – Calvert to Kagaru – 10 May 2017.	ARTC (2017)	■ Confirmation of the presence of the Swamp tea-tree (*Melaleuca irbyana*) during field investigations ■ Observations of feeding signs (i.e. orts) of Glossy black-cockatoos (*Calyptorhynchus lathami*) during field investigations
Inland Rail – Gowrie to Kagaru Geotechnical investigations. MNES assessment report – 23 July 2018	EMM (2018)	■ Confirmation of the presence of the Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland TEC particularly around Ebeneezer

Document title	Reference	Summary of significant findings related to MNES
Inland Rail – Gowrie to Kagaru Geotechnical investigations. Protected plant survey reports (2018 and 2019) Preclearance survey reports (2018 and 2019)	EMM (2018; 2019)	▪ No threatened species observed
Inland Rail – Calvert to Kagaru Geotechnical investigations. Protected plants flora survey reports (8 May 2019, 20 June 2019) Preclearance survey report (11 June 2019)	ELA (2019)	▪ Confirmation of the presence of the Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland TEC east of Paynes Road (June 2019)

In addition to the data sources identified above, findings associated with EIS field investigations/analysis assisted in the validation and iteration of the predictive habitat mapping. However, it must be noted that field investigations were subject to voluntary land access agreements which place heavy restrictions upon area that were accessible.

In addition to previous surveys and site based investigations, recovery programs were assessed in order to identify areas of high conservation significance or of recognised conservation value for each of the MNES migratory species or NC Act threatened or near-threatened species subject to predictive habitat modelling.

Of the EPBC Act migratory species identified as potentially impacted by the project activities, six are subject to the Draft Referral guideline for 14 birds listed as migratory species under the EPBC Act (Commonwealth of Australia 2015). These consist of the following:

- Osprey (*Pandion haliaetus*)
- Oriental cuckoo (*Cuculus optatus*)
- Satin flycatcher (*Myiagra cyanoleuca*)
- Rufous fantail (*Rhipidura rufifrons*)
- Black-faced monarch (*Monarcha melanopsis*)
- Yellow wagtail (*Motacilla flava*)

Information contained within the Draft Referral guideline for the species identified above was used to inform the predictive mapping for the relevant species.

2 Species included within the predictive habitat mapping model

A total of three conservation significant flora species and four conservation significant fauna species listed under the provisions of NC Act were identified as occurring or potentially occurring within the ecology study area (refer Table 2.1 and Table 2.2). All of these species have potential to occur within the ecology study area.

In addition, ten migratory species as listed under the EPBC Act have been identified from desktop based assessments as potentially occurring within the ecology study area (refer Table 2.3). All of these species have undergone habitat modelling.

Table 2.1 Conservation significant flora species identified from database searches

Family	Species name	Common name	NC Act status*	Data source			Likelihood of occurrence
				WildNet	PMST	Atlas	
Cupressaceae	*Callitris baileyi**	Bailey's cypress	NT				Possible
Apocynaceae	*Marsdenia coronata*	Slender milkvine	V	✓			Possible
Myrtaceae	*Melaleuca irbyana*	Swamp tea-tree	E	✓		✓	Likely

Table notes:
E = Endangered V = Vulnerable NT = Near threatened
✓ = species present within database record within the ecology study area

Table 2.2 Conservation significant fauna species identified from database searches

Family	Species name	Common name	NC Act status*	Data source			Likelihood of occurrence
				WildNet	PMST	Atlas	
Cacatuidae	*Calyptorhynchus lathami*^	Glossy black-cockatoo	V				Likely
Limnodynastidae	*Adelotus brevis*^	Tusked frog	V				Likely
Strigidae	*Ninox strenua*	Powerful owl	V	✓			Possible
Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	✓		✓	Likely

Table notes:
V = Vulnerable SL = Special least concern
✓ = species present within database record within the ecology study area PMST = Protected Matters Search Tool
^ = species not returned in database searches but has been included as it has been previously identified from the broader region

Table 2.3 Migratory fauna species identified from database searches

Family	Scientific name	Common name	EPBC Act status*	Data source			Likelihood of occurrence
				WildNet	PMST	Atlas	
Accipitridae	*Pandion haliaetus*	Osprey	M		✓		Possible
Cuculidae	*Cuculus optatus*	Oriental cuckoo	M		✓		Likely
Dicruridae	*Myiagra cyanoleuca*	Satin flycatcher	M		✓		Likely
Dicruridae	*Rhipidura rufifrons*	Rufous fantail	M	✓	✓	✓	Likely
Dicruridae	*Monarcha melanopsis*	Black-faced monarch	M	✓	✓	✓	Likely
Dicruridae	*Symposiachrus trivirgatus*	Spectacled monarch	M		✓		Possible
Motacillidae	*Motacilla flava*	Yellow wagtail	M		✓		Possible

Family	Scientific name	Common name	EPBC Act status*	Data source			Likelihood of occurrence
				WildNet	PMST	Atlas	
Scolopacidae	*Actitis hypoleucos*	Common sandpiper	M		✓		Possible
Scolopacidae	*Calidris acuminata*	Sharp-tailed sandpiper	M		✓		Possible
Scolopacidae	*Gallinago hardwickii*	Latham's snipe	M		✓		Possible
Threskiornithidae	*Plegadis falcinellus*	Glossy ibis	M	✓	✓	✓	Likely

Table notes:

M = Migratory

✓ = species present within database record within the ecology study area PMST = Protected Matters Search Tool

3 Predictive habitat modelling input datasets

Predictive habitat modelling was undertaken to identify and map areas that are considered to have the potential to provide habitat for the conservation significant species and communities listed in Table 2.1 Table 2.2 and Table 2.3 which have potential to occur within the ecology study area. This modelling provides an additional tool to assess the likely occurrence of species and communities of interest and facilitates impact assessment by allowing for the quantification of areas of habitat using GIS.

In addition to specimen and community specific RE associations that are identified within Table 5.1, Table 5.2 and Table 5.3, additional GIS layers and field derived information have been utilised to identify areas of habitat within the Project ecology study area where applicable to a species. These layers include:

- RE datasets (Version 11) and pre-clearing regional ecosystem layers
- High resolution aerial photography with site derived datasets (i.e. utilisation of condition data, species records and general observational data pertaining to species habitat)
- Historic records of conservation significant species (derived from government databases and previous ecological investigations)
- Field derived datasets related to habitat suitability and the presence of micro-habitat features
- Topographic and geological information
- Government derived cadastral datasets
- Drainage datasets (Waterway barrier works mapping).

4 Predictive habitat modelling categories

4.1 Matters of national environmental significance migratory species

4.1.1 General context

Each predictive habitat model allowed partitioning of migratory fauna species using current scientific knowledge and pre-existing data derived from historic surveys and State based mapping identified above. The specific habitat assumptions for each species that were subject to predictive mapping are provided in Table 5.1.

The species-specific assumptions allowed the following areas to be identified for each threatened species:

- Unlikely habitat
- Potential habitat
- Important habitat.

The use of these habitat categories aligns with the Commonwealth Department of Agriculture, Water and Environment's (DAWE's) habitat definitions for species protected under the *Environment Protection and Biodiversity Conservation Act 1999*.

An overview of each of these categories is provided in the sections below.

4.1.2 Unlikely habitat

Unlikely habitat consists of areas that do not contain specimen backed records of the particular species (i.e. no point data derived from the positive identification/confirmation of a species in the field) and contain no evidence of habitat values to support the presence or existence of resident individuals or populations of the species. However, it is acknowledged that these areas may provide temporary habitat for species during exceptional circumstances. It is considered that occurrences of the subject species within these areas is an anomaly as these areas are not likely to support the species in the long term.

4.1.3 Potential habitat

Potential habitat consists of areas or locations used by transient individuals or where species may have been recorded but where there is insufficient information to assess the area as Important habitat. Potential habitat also includes habitat that is considered to potentially support a species according to expert knowledge of habitat relationships, despite the absence of specimen backed records. Potential habitat may include areas of suboptimal habitat for species. Species specific assumptions that define the Potential habitat category are identified in Table 5.1

4.1.4 Important habitat

In line with DAWE's guidelines, Important habitat has been identified for migratory species under the Draft Referral guideline for 14 birds listed as migratory species under the EPBC Act. Important habitat for migratory birds is defined in Table 2 of the Draft Referral guideline for 14 birds listed as migratory species under the EPBC Act (Commonwealth of Australia 2015).

Species specific assumptions that define the Important habitat category for the abovementioned species is provided in Table 5.1

4.2 Species listed under the NC Act

4.2.1 General context

Each predictive habitat model allowed partitioning of habitat for flora and fauna species using current scientific knowledge and pre-existing data derived from historic surveys and State based mapping identified above. The specific habitat assumptions for each species that were subject to predictive mapping are provided in Table 5.2 and Table 5.3.

The species-specific assumptions allowed the following areas to be identified for each threatened species:

- Unlikely habitat
- General habitat
- Essential habitat
- Core habitat.

The use of these habitat definitions has been accepted by the Commonwealth Department of Environment and Energy (DotEE) for similar linear infrastructure project EISs (e.g. Santos Gas Field Development EIS) and negotiations with the regulators at the inception of the Project EIS has indicated that they are amenable to the use of this modelling for the Project EIS.

An overview of each of these categories for NC Act listed species is provided in the sections below. A schematic of the interaction between the habitat categories for NC Act listed species is presented in Figure 5.1.

4.2.2 Unlikely habitat

Unlikely habitat consisted of areas that do not contain specimen backed records of the particular species (i.e. no point data derived from the positive identification/confirmation of a species in the field) and contain no evidence of habitat values to support the presence or existence of resident individuals or populations of the species. However, it is acknowledged that these areas may provide temporary habitat for species during exceptional circumstances. It is considered that occurrences of the subject species within these areas is an anomaly.

4.2.3 General habitat

General habitat consisted of areas or locations used by transient individuals or where species may have been recorded but where there is insufficient information to assess the area as essential or core habitat (i.e. records of the species are considered anomalies as general microhabitat features are not considered to be present from a desktop perspective). General habitat also includes habitat that is considered to potentially support a species according to expert knowledge of habitat relationships, despite the absence of specimen backed records. General habitat may include areas of suboptimal habitat for species. Species specific assumptions that define the general habitat category are identified in Table 5.2 and Table 5.3.

4.2.4 Essential habitat

Essential habitat consists of areas containing resources that are considered essential for the maintenance of populations of the species (e.g. potential habitat for breeding, roosting, foraging, shelter) or areas that have been confirmed as containing suitable habitat as identified by a specimen backed record or indirect evidence of the species (i.e. scat, trace, track, fur/feather, distinctive vocalisation or other site based evidence). Essential habitat has been defined from known records (regardless of currency), generally with a 1 km buffer or site-based observation of the species during site investigations. In addition, if the 1 km buffer from the known record intersects an area identified as general habitat the general habitat rating was elevated to essential habitat. Species specific assumptions associated with the mapping of essential habitat, and instances that deviate from the above criteria are detailed in Table 5.2 and Table 5.3.

4.2.5 Core habitat

Core habitat consists of essential habitat in which the species is known, and the habitat is recognised under relevant recovery plans or other relevant plans/policies/regulations. Where essential habitat intersects with areas identified as important within the relevant bioregion specific Biodiversity Planning Assessment (BPA), these areas have been elevated to the core habitat category. Species specific assumptions associated with the mapping of core habitat areas are detailed in Table 5.2 and Table 5.3.

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5 Predictive habitat models and general assumptions associated with their development

5.1 Flora and fauna habitat models

The predictive flora habitat model for each flora and fauna species was designed to provide a dynamic, robust and predictive GIS layer that could incorporate data from scientific literature, verified government datasets, specimen backed datasets (i.e. data derived from a known/confirmed location of an observed specimen) and field identified records into a single layer that could be used to identify areas that are known, or considered to have the potential to support specific EPBC Act listed migratory species and NC Act threatened and near-threatened species. Development of these layers had the ultimate objective to:

- Predict areas that have the potential to support EPBC Act listed migratory fauna species
- Predict areas that have the potential to support NC Act listed threatened and near-threatened flora and fauna species
- Facilitate the quantification of impacts to inform later stages of the EIS process
- Facilitate the assessment of assessment of impact significance in accordance with relevant MNES and MSES significant impact criteria, policies and guidelines.

The habitat modelling was created using ESRI ArcGIS, specifically the ESRI ArcGIS Model Builder which facilitated the development of scripts that allowed for the species-specific development of queries that utilised a range of GIS input datasets (e.g. vegetation communities containing site derived and filed verified information).

The models also incorporated the use of selecting relevant components and performing functions such as buffers and intersects that reflected the preferred habitat of a particular species. As a result of this process output habitat layers were generated for each species according to their individual requirements. The species-specific requirements that were used to generate the species-specific queries used to map potential habitat are identified in Table 5.1, Table 5.2 and Table 5.3 . Once produced model outputs were reviewed internally by suitably qualified and experience ecologists to assess that they accurately reflected/identified habitat suitable for supporting the relevant species. If anomalies were identified, GIS iterations were undertaken to produce outputs of greater accuracy. However, it is noted that whilst species that were identified to have potential to occur within the broader region underwent habitat modelling, the results of the modelling did not necessarily identify habitat within the ecology study area for all of the species modelled. Where this occurred, these species (i.e. without identified habitat within the ecology study area) did not undergo impact assessment as part of the Project EIS.

As the predictive flora and fauna habitat model mapping has been designed to identify areas of potential habitat for NC Act and/or EPBC Act listed species, several assumptions to the model have been made and derived from scientific literature and expert advice. These assumptions are outlined below.

- Heterogeneous RE polygons – Mapping has been designed to identify maximum areas of disturbance based on a precautionary approach. In the case of heterogeneous polygons, if the RE code is contained within the heterogeneous polygon, then the entire polygon is selected. This is of particular importance to species such as those that rely on limited areas of habitat, which would otherwise be missed by the model. Areas of predicted habitat may be removed from mapping if field survey indicates that habitat is not available.
- Buffers – Buffers have been used when integrating a specimen backed record into the predicted mapping. Generally, a 1 km buffer from the species data point is used (in line with the methodology adopted by the [VM Act] when identifying essential habitat derived from a specimen backed record). Deviations from this methodology (where they occur), are identified in Table 5.1, Table 5.2 and Table 5.3.

- Essential habitat / Important habitat – The predictive flora and fauna habitat mapping outlined in this document primarily proposes general habitat / potential habitat as the preferred habitat requirements for many of the species mapped. This is as a result of their habitat not being fully understood or cannot be easily extrapolated from available datasets. In most cases, site derived species records were used to extrapolate preferred habitat by correlating with the underlying GIS layer. In these instances, mapped habitat will overlap with the predicted general habitat/potential habitat, which has not been elevated to the essential habitat / Important habitat level in accordance with that adopted under the VM Act. For these species, where a species point record and associated 1 km buffer intersect with areas of predicted general habitat, the area of overlap has been elevated to the essential habitat category. In instances where essential habitat is located within an area of protection, this is elevated to core habitat or Important habitat. The relationship between general habitat, species records, essential habitat, protected areas and core habitat, is outlined in Figure 5.1.
- Use of existing specimen backed records to identify habitat associations – In instances where there was insufficient literature to confidently identify areas of potential habitat, specimen backed records were used to identify the associated vegetation association (e.g. RE type). These point-selected datasets were then assessed to determine that they were consistent with the species habitat requirements. When identified as valid, the point selected data points were incorporated into the predictive mapping "recipe" for the particular species (refer Table 5.1, Table 5.2 and Table 5.3). Point selected datasets that were not identified as being able to support the species were rejected from use in further analysis.
- Minimum areas of habitat – Mapping has been designed to identify maximum areas of disturbance and therefore no minimum area of habitat has been identified. The methodology was developed to predict areas of potential habitat. However, the resolution of the mapping is constrained by the data inputs (e.g. RE mapping) and therefore areas that may potentially be identified as habitat will always be contiguous to areas of similar habitat that reflect the minimum resolution for the input dataset (e.g. minimum RE polygon size, etc.).
- Levels of habitat mapping – General habitat/ potential habitat has primarily been indicated on the predictive mapping. However, where areas identified in relevant recovery programs or referral guidelines have been identified and these areas overlap with areas of predicted general/predicted habitat category, these areas have been elevated to Essential or Important habitat in line with the information contained within the relevant species advice/guideline or policy.

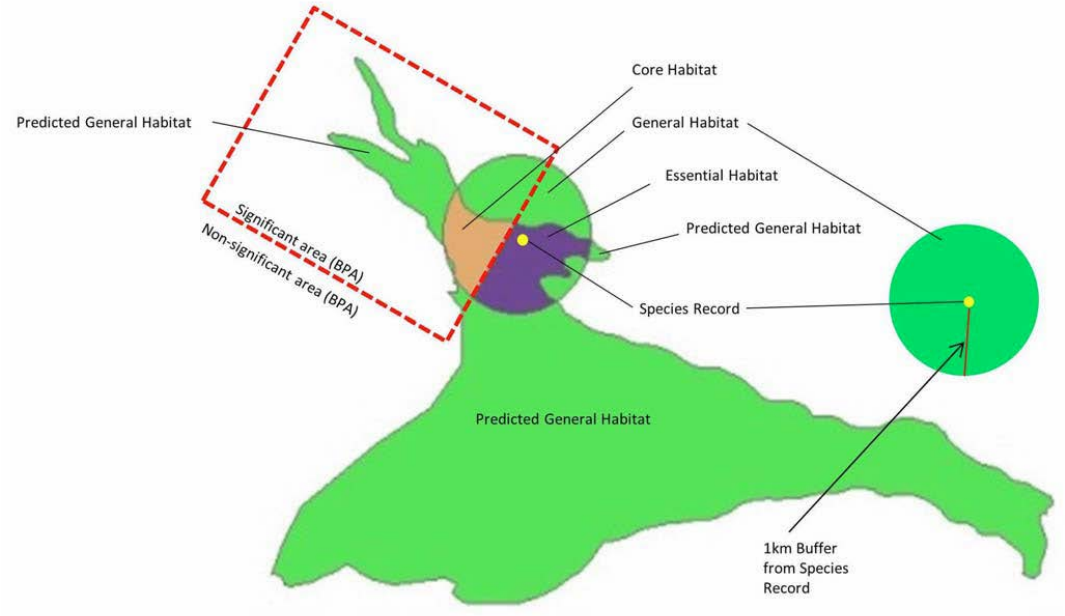

Figure 5.1 **Schematic indicating the relationship between specimen backed records, predicted general habitat, essential habitat and core habitat category designations for species listed under the NC Act**

Table 5.1 EPBC Act listed migratory species habitat assumptions used to map areas of occurrence within ecology study area

Class	Scientific name	Common name	Status		Habitat requirements that are the basis for the GIS assumptions (derived from references provided within the bibliography)	GIS habitat modelling instructions	
			NC Act	EPBC Act		Potential habitat	Important habitat
Birds	Oriental cuckoo (*Cuculus optatus*) Satin flycatcher (*Myiagra cyanoleuca*) Rufous fantail (*Rhipidura rufifrons*) Black-faced monarch (*Monarcha melanopsis*) Spectacled monarch (*Symposiachrus trivirgatus*)	Forest/ woodland migrants	SLC	M	This fauna group are typically found in complex habitats, including rainforests, vine thickets and wet sclerophyll forest gullies. However, during migration these species will utilise drier habitats such as riparian forests and woodlands, and larger open forest to woodland remnants with a dense understorey (Pizzey and Knight 2007).	The following is considered to be general habitat: Remnant RE within 100 m of a waterway (stream order 3 or above) BVG (5M): 1 Remnant greater than 200 ha of the following REs: 11.8.5, 11.2.5, 11.5.2, 11.5.9, 11.7.1, 11.8.13, 11.8.15, 11.12.21, 12.3.3, 12.3.19, 12.9-10.11, 12.9-10.27, 12.11.3, 12.2.14, 12.3.11 *Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute potential habitat*	All areas of potential habitat associated with the following REs constitutes Important habitat: 11.8.5, 11.2.5, 11.5.2, 11.5.9, 11.7.1, 11.8.13, 11.8.15, 11.12.21, 12.3.3, 12.3.19, 12.9-10.11, 12.9-10.27, 12.11.3, 12.2.14, 12.3.11
Birds	Yellow wagtail (*Motacilla flava*) Common sandpiper (*Actitis hypoleucos*) Sharp-tailed sandpiper (*Calidris acuminata*) Latham's snipe (*Gallinago hardwickii*) Glossy ibis (*Plegadis falcinellus*)	Wetland/ wader migrants	SLC	M	These are wetland species that associated with waterbodies, flooded paddocks and areas of inundation.	The following is considered to constitute general habitat: Lacustrine REs, lacustrine water bodies, palustrine REs, palustrine water bodies, riverine REs, riverine water bodies, estuarine REs, estuarine water bodies, marine REs and marine water bodies *Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute potential habitat*	Non-breeding habitat only: mostly well-watered open grasslands and the fringes of wetlands. Roosts in mangroves and other dense vegetation. Therefore a 100 m buffer around the following is considered important habitat: Lacustrine REs, lacustrine water bodies, palustrine REs, palustrine water bodies, riverine REs, riverine water bodies, estuarine REs, estuarine water bodies, marine REs and marine water bodies

Class	Scientific name	Common name	Status		Habitat requirements that are the basis for the GIS assumptions (derived from references provided within the bibliography)	GIS habitat modelling instructions	
			NC Act	EPBC Act		Potential habitat	Important habitat
Birds	Osprey (*Pandion haliaetus*) - incorporating the synonym *Pandion cristata*	Waterway/ Marine migrant	SLC	M	The Osprey is found in coastal areas including beaches and estuaries. Nest trees are usually 1 km from the sea (NSW OEH).	The following is considered to constitute General habitat: Lacustrine REs, Lacustrine Water bodies, Palustrine REs, Palustrine Water bodies, Riverine REs, Riverine Water bodies, Estuarine REs, Estuarine Water bodies, Marine REs and Marine Water bodies *Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute potential habitat*	Bays, estuaries, along tidal stretches of large coastal rivers, mangrove swamps, coral and rock reefs, terrestrial wetlands and coastal lands of tropical and temperate Australia and off shore islands. They feed primarily in the sea or nearby estuarine waters and nest in trees (often dead or with dead tops), rocky coastlines and on artificial structures such as telecommunication towers. Ospreys are generally found on or near the coast but also range inland along large rivers, mainly in northern Australia. As such all areas of potential habitat that intersect with a wetland are Important habitat

Table notes:

M = Migratory SL = Special least concern

Table 5.2 Listed NC Act conservation significant flora species habitat assumptions used to map areas of occurrence within ecology study area

Family	Scientific name	Common name	NC Act status*	Habitat requirements that are the basis for the GIS assumptions (derived from references provided within the bibliography)	Habitat modelling assumptions		
					General habitat	Essential habitat	Core habitat
Apocynaceae	*Marsdenia coronata*	Slender Milkvine	V	*Marsdenia coronata* is restricted to southeast Queensland where it commonly grows in rainforest or moist areas of open forest, especially in eucalypt forest (Borsboom and Wang 1996). It has been observed on rainforest margins. Also recorded from an area of natural grassland on the top of Mt Kandanga, Imbil State Forest. The vine has been found between 40 and 780 m above sea level, and usually occurs on sandstone or stony soils (Borsboom and Wang 1996; Queensland Herbariums 2011).	The following REs are considered to be general habitat when they occur at an elevation of between 40 and 780 m above sea level: 12.3.18, 12,11.1, 12.11.3, 12.11.3a, 12.11.3b, 12.12.1 and 12.12.15 *Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs*	Any specimen backed records (buffered to a 1 km radius) that fall within areas mapped as *general habitat* (refer previous column) constitute *essential habitat*	Core habitat has not been mapped for this species
Cupressaceae	*Callitris baileyi*	Bailey's cypress	NT	*Callitris baileyi* grows on rocky slopes, hilly or mountainous areas, in shallow and often clay soils. It is found in eucalypt woodland, commonly associated with ironbark, blue gum and spotted gum. (DEC 2005; Stanley and Ross 1983).	The following REs are considered to be general habitat: 12.5.13, 12.5.13b, 12.8.16, 12.8.21, 12.9-10.2, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.15, 12.9-10.17, 12.9-10.18, 12.9-10.27, 12.11.5, 12.11.5a, 12.11.5e, 12.11.6, 12.11.14, 12.11.19, 12.12.3, 12.12.5, 12.12.7, 12.12.12 *Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute general habitat*	Any specimen backed records (buffered to a 1 km radius) that fall within areas mapped as *general habitat* (refer previous column) constitute *essential habitat*	Core habitat has not been mapped for this species

Family	Scientific name	Common name	NC Act status*	Habitat requirements that are the basis for the GIS assumptions (derived from references provided within the bibliography)	Habitat modelling assumptions		
					General habitat	Essential habitat	Core habitat
Myrtaceae	*Melaleuca irbyana*	Swamp tea-tree	E	*Melaleuca irbyana* grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and *Melaleuca* woodland with a sparse and grassy understorey. It grows on poorly draining, heavy clay soils. (Byrnes 1984; Barlow 1987).	The following REs (remnant, regrowth and prelclear) are considered to be general habitat: 12.3.3.b, 12.3.3.c, 12.3.18, 12.3.19, 12.5.2, 12.5.2x1, 12.9-10.11, 12.9.10.11a, 12.9-10.27 *Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute general habitat*	Any specimen backed records (buffered to a 1 km radius) that fall within areas mapped as *general habitat* (refer previous column) constitute *essential habitat*	Core habitat has not been mapped for this species

Table notes:

E = Endangered V = Vulnerable NT = Near threatened

Table 5.3 Listed NC Act conservation significant fauna species habitat assumptions used to map areas of occurrence within the ecology study area

Class	Scientific name	Common name	NC Act status*	Habitat requirements that are the basis for the GIS assumptions (derived from references provided within the bibliography)	GIS habitat modelling instructions		
					General habitat	Essential habitat	Core habitat
Birds	*Ninox strenua*	Powerful owl	V	The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine (*Syncarpia glomulifera*), Black She-oak (Allocasuarina littoralis), Blackwood (*Acacia melanoxylon*), Rough-barked Apple (*Angophora floribunda*), Cherry Ballart (*Exocarpus cupressiformis*) and a number of eucalypt species.	The following Regional Ecosystems are considered to be General habitat: 11.3.4, 11.3.14, 11.3.23, 11.3.25, 11.3.39, 11.8.2, 11.8.8, 11.10.2, 11.10.2a, 11.12.13b, 12.2.4, 12.2.5, 12.2.14, 12.3.2, 12.3.2a, 12.3.15, 12.5.11, 12.8.1, 12.8.8, 12.9-10.1, 12.9-10.5, 12.9-10.14, 12.9-10.14a, 12.11.1, 2.11.2, 12.11.9x1, 12.12.1, 12.12.4, 12.12.6, 12.12.6x1, 12.12.14, 12.12.22, Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute General habitat	Any specimen backed records (buffered to a 1 km radius) that fall within areas mapped as General habitat (refer previous column) constitute Essential habitat	Any area identified as Essential habitat (refer previous column) that intersects with any area identified under the BPA mapping as 'H-Rating' (High or medium), 'J Rating' (Regional or State) or 'A Rating' (Very high, High or Medium), of any areas mapped as a national park, state forest or Nature refuge area or mapped as a voluntary Declaration (VDEC) are Core habitat.
Birds	*Calyptorhynchus lathami*	Glossy black-cockatoo	V	Glossy black-cockatoo is found in open forest to woodland with *Allocasuarina littoralis, A. torulosa, A. luehmanni, Casuarina cristata, and C. equisetifolia*. Seeds of the above listed species are the sole food source for this bird.	The following RE is considered general habitat: 12.2.14, 12.2.19b, 12.8.23, 12.9-10.6, 12.12.26, 12.2.13, 12.5.4, 12.5.9, 12.8.14, 12.8.20, 12.9-10.4, 12.9-10.9, 12.11.9, 12.11.5, 12.11.21, 12.12.7, 12.12.9, 12.12.23, 11.10.4, 11.12.5. In addition, and areas identified as habitat during GHD's surveys undertaken in 2016 are considered habitat.	Any specimen backed records (buffered to a 1 km radius) that fall within areas mapped as *General habitat* (refer previous column) constitute *Essential habitat*	Any area identified as Essential habitat (refer previous column) that intersects with any area identified under the BPA mapping as 'H-Rating' (High or medium), 'J Rating' (Regional or State) or 'A Rating' (Very high, High or Medium), of any areas mapped as a national park, state forest or Nature refuge area or mapped as a

Class	Scientific name	Common name	NC Act status*	Habitat requirements that are the basis for the GIS assumptions (derived from references provided within the bibliography)	GIS habitat modelling instructions		
					General habitat	**Essential habitat**	**Core habitat**
					Note: Any specimen backed records or areas containing orts (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute General habitat		voluntary Declaration (VDEC) are Core habitat.
Mammals	*Tachyglossus aculeatus*	Short-beaked echidna	SLC	The Short-beaked echidna is found in forests, woodlands, heath, grasslands and desert	The following is considered to be general habitat: All RE habitat (with an additional 50 m into no-remnant areas) excluding land zones 2 and RE 11.3.11, 11.3.40, 11.8.13, 11.10.8, 11.11.5, 11.4.1, 11.5.15, 11.7.1, 11.8.3, 11.9.4, 11.9.5, 11.10.8, 11.11.18, 11.11.21, 11.12.4, 11.12.7, 12.3.1, 12.3.16, 12.3.17, 12.3.21, 12.8.15, 12.11.1, 12.12.1, 12.5.13, 12.8.21, 12.8.22, 12.8.23, 12.9-10.15, 12.11.4, 12.11.13, 12.12.17, 12.12.18 and 12.12.26 *Note: Any specimen backed records (buffered to a 1 km radius) that fall outside of the REs identified above are considered to constitute general habitat*	Any specimen backed records (buffered to a 1 km radius) that fall within areas mapped as *general habitat* (refer previous column) constitute *essential habitat*	Any area identified as *essential habitat* (refer previous column) that intersects with any area identified under the BPA mapping as 'H Rating' (high or medium), 'J Rating' (Regional or State) or 'A Rating' (very high, high or medium), of any areas mapped as a national park, state forest or nature refuge area or mapped as a VDEC are *core habitat*.

Class	Scientific name	Common name	NC Act status*	Habitat requirements that are the basis for the GIS assumptions (derived from references provided within the bibliography)	GIS habitat modelling instructions		
					General habitat	Essential habitat	Core habitat
Amphibians	*Adelotus brevis*	Tusked frog	V	Inhabits wet eucalypt forest, rainforest, and sometimes dry eucalypt forest, where it can be found in close proximity to suitable breeding habitat such as ponds and slow-moving sections of streams (Cogger 2000; Meyer et al. 2001; Hines 2012). Also recorded from dams and garden ponds in urban and peri-urban areas (Hines 2012).	The following Regional Ecosystems are considered to constitute general habitat when they are located within 100m (ie create a buffer, which will be used to "cleave" larger REs to create new polygons) of a watercourse (stream order 3 and above): 12.2.1, 12.2.2, 12.2.3, 12.2.4, 12.2.6, 12.2.11, 12.3.1, 12.3.1a, 12.3.2, 12.3.3, 12.3.7, 12.3.10, 12.3.12, 12.3.16, 12.3.21, 12.5.13, 12.5.13a, 12.5.13b, 12.5.13c, 12.8.3, 12.8.4, 12.8.5, 12.8.8, 12.8.9, 12.8.13, 12.8.18, 12.8.21, 12.8.22, 129-10.15, 12.9-10.16, 12.11.1, 12.11.2, 12.11.3, 12.11.4, 12.11.10, 12.11.11, 12.11.12, 12.11.13, 12.12.1, 12.12.13, 12.12.15, 12.12.15a, 12.12.16, 12.12.17, 12.12.18, 11.2.1, 11.3.2, 11.3.3, 11.3.4a, 11.3.6, 11.3.7, 11.3.8, 11.3.9, 11.3.10, 11.3.11, 11.3.11x1, 11.3.13, 11.3.14, 11.4.1, 11.5.15, 11.7.1x1, 11.8.3, 11.3.13, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.23, 11.3.27, 11.3.28, 11.3.29, 11.3.35, 11.3.36, 11.3.37, 11.3.39, 11.9.4, 11.9.4a, 11.9.4c, 11.10.8, 11.11.5, 11.11.5a, 11.11.18, 11.11.21, 11.12.4, 11.12.4a	Any specimen backed records (buffered to a 1 km radius) that fall within areas mapped as *General habitat* (refer previous column) constitute *Essential habitat*	Any area identified as *Essential habitat* (refer previous column) that intersects with any area identified under the BPA mapping as 'H-Rating' (High or medium), 'J Rating' (Regional or State) or 'A Rating' (Very high, High or Medium), of any areas mapped as a national park, state forest or Nature refuge area or mapped as a voluntary Declaration (VDEC) are *Core habitat*.

Table notes:

V = Vulnerable SL = Special least concern

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7.2.2 Birds

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7.2.3 Amphibian

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APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix B Species and Community Profiles

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Inland Rail: Phase 2 - Calvert to Kagaru

Appendix B - Species and Community Profiles

Australian Rail Track Corporation

Reference: 3400

Contents

1 Flora – Threatened species 1

1.1 Bailey's cypress pine (*Callitris baileyi*) 1
1.2 Slender milkvine (*Marsdenia coronata*) 4
1.3 Swamp tea-tree (*Melaleuca irbyana*) 6

2 Fauna – Threatened species – Birds 10

2.1 Glossy black-cockatoo (*Calyptorhynchus lathami lathami*) 10
2.2 Powerful owl (*Ninox strenua*) 13
2.3 Tusked frog (*Adelotus brevis*) 17

3 Fauna – Migratory species – Birds 21

3.1 Black-faced monarch (*Monarcha melanopsis*) 21
3.2 Common sandpiper (*Actitis hypoleucos*) 24
3.3 Eastern osprey (*Pandion haliaetus*) 27
3.4 Glossy ibis (*Plegadis falcinellus*) 30
3.5 Latham's snipe (*Gallinago hardwickii*) 33
3.6 Oriental cuckoo (*Cuculus optatus*) 37
3.7 Pectoral sandpiper (*Calidris melanotos*) 40
3.8 Rufous fantail (*Rhipidura rufifrons*) 43
3.9 Satin flycatcher (*Myiagra cyanoleuca*) 47
3.10 Sharp-tailed sandpiper (*Calidris acuminata*) 50
3.11 Spectacled monarch (*Symposiachrus trivirgatus*) 53
3.12 Yellow wagtail (*Motacilla flava*) 56

4 Fauna – Special least concern – mammals 60

4.1 Short-beaked echidna (*Tachyglossus aculeatus*) 60

Figures

Figure 1.1 Distribution range of the Bailey's cypress pine
Figure 1.2 Distribution range of the Bailey's cypress pine in relation to the Project
Figure 1.3 Distribution range of the Slender milkvine
Figure 1.4 Distribution range of the Slender milkvine in relation to the Project
Figure 1.5 Distribution range of Swamp tea-tree
Figure 1.6 Distribution range of Swamp tea-tree in relation to the Project
Figure 2.1 Distribution range of Glossy black-cockatoo
Figure 2.2 Distribution range of Glossy black-cockatoo in relation to the Project
Figure 2.3 Distribution range of the Powerful owl
Figure 2.4 Distribution range of the Powerful owl in relation to the Project
Figure 2.5 Distribution range of the Tusked frog
Figure 2.6 Distribution range of the Tusked frog in relation to the Project
Figure 3.1 Distribution range of the Black-faced monarch
Figure 3.2 Distribution range of the Black-faced monarch in relation to the Project
Figure 3.3 Distribution range of the Common sandpiper
Figure 3.4 Distribution range of the Common sandpiper in relation to the Project
Figure 3.5 Distribution range of the Eastern osprey
Figure 3.6 Distribution range of the Eastern osprey in relation to the Project
Figure 3.7 Distribution range of the Glossy ibis
Figure 3.8 Distribution range of the Glossy ibis in relation to the Project
Figure 3.9 Distribution range of the Latham's Snipe

Figure 3.10 Distribution range of the Latham's Snipe in relation to the Project
Figure 3.11 Distribution range of the Oriental cuckoo
Figure 3.12 Distribution range of the Oriental cuckoo in relation to the Project
Figure 3.13 Distribution range of the Pectoral sandpiper
Figure 3.14 Distribution range of the Pectoral sandpiper in relation to the Project
Figure 3.15 Distribution range of the Rufous fantail
Figure 3.16 Distribution range of the Rufous fantail in relation to the Project
Figure 3.17 Distribution range of the Satin flycatcher
Figure 3.18 Distribution range of the Satin flycatcher in relation to the Project
Figure 3.19 Distribution range of the Sharp-tailed sandpiper
Figure 3.20 Distribution range of the Sharp-tailed sandpiper in relation to the Project
Figure 3.21 Distribution range of the Spectacled monarch
Figure 3.22 Distribution range of the Spectacled monarch in relation to the Project
Figure 3.23 Distribution range of the Yellow wagtail
Figure 3.24 Distribution range of the Yellow wagtail in relation to the Project
Figure 4.1 Distribution range of the Short-beaked echidna
Figure 4.2 Distribution range of the Short-beaked echidna in relation to the Project

1 Flora – Threatened species

1.1 Bailey's cypress pine (*Callitris baileyi*)

1.1.1 Status

NC Act – Near threatened

1.1.2 Biology and ecology

1.1.2.1 Characteristic

Bailey's cypress pine (*Callitris baileyi*) is a tree growing to 18 m tall, with spreading or erect branches and rough greyish bark. The foliage is green, rather than bluish as with many other cypress pines (refer Photograph 1.1). The adult leaves are 2 to 5 mm long and arranged in threes, parallel with the stem. A sharp keel runs down the back of each leaf. Male and female cones occur on the same tree. Male cones are 2 to 3 mm long and are on the ends of the branchlets. Female cones are solitary on slender fruiting branchlets and are waxy, greyish-blue during development. The oblong cones measure 10 to 13 mm in diameter and the alternate scales on the cones are shorter and narrower. The central stalk of the cone is short, narrow at the base and slightly angled (Stanley and Ross 1983; OEH 2018; Harden and Thompson 2008).

Photograph 1.1 Bailey's cypress pine (*Callitris baileyi*)

Source: Miles (2017)

1.1.2.2 Known distribution

Bailey's cypress pine is found sporadically in southeast Queensland and far north NSW. It is found from around Kumbia and Yarraman to west of Brisbane down across the NSW border near Tabulum (OEH 2018) (refer Figure 1.1).

Figure 1.1 **Distribution range of the Bailey's cypress pine**

Source: ALA (2020)

1.1.2.3 Distribution in relation to the project

Callitris baileyi has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA, WildNet) indicated a record from 10 km east of the disturbance footprint at Koala Crossing Nature Reserve and approximately 15 km east of the Project at Rosewood (refer Figure 1.2). This species has not been detected during field investigations that have been carried out at the site.

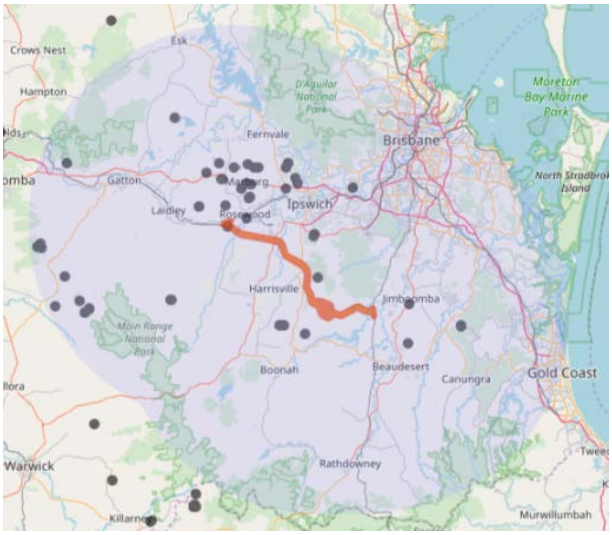

Figure 1.2 **Distribution range of the Bailey's cypress pine in relation to the Project**

Source: ALA (2020)

1.1.2.4 Biology and reproduction

Male and female cones occur on the same tree and are recorded all year round, however not much else is known about reproduction in Bailey's cypress pine (Stanley and Ross 1983).

1.1.3 Habitat

Bailey's cypress pine grows on rocky slopes, hilly or mountainous areas, in shallow and often clay soils. It is found in eucalypt woodland, commonly associated with ironbark, blue gum and spotted gum (OEH 2018; Stanley and Ross 1983).

1.1.4 Threatening processes

The following have been identified as potentially threatening processes to Bailey's cypress pine:

- Fire
- Risk of local extinction because population is small
- Trampling by livestock and people
- Clearing of habitat for agriculture
- Road and track maintenance works
- Grazing and disturbance by feral browsing animals (OEH 2018).

1.1.5 Threat abatement/recovery plans

The following threat abatement/recovery plan has been identified as relevant for this species:

- Office of Environment and Heritage (2016), *Saving our Species Programme*. Available from https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=316&ReportProfileID=10131. In effect under the BC Act 2016.

1.1.6 Summary of threat abatement/recovery plan

The conservation strategy for Bailey's cypress pine identifies two priority management sites in NSW including:

- Trough Creek in Tenterfield LGA
- Sandilands in Kyogle LGA.

Threats specific to Bailey's cypress pine identified in the strategy include:

- current or potential future land management practices do not support conservation
- trampling by stock
- physical damage by campers and trail bikers
- risk of local extinction because population is small.

1.1.7 References

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1.2 Slender milkvine (*Marsdenia coronata*)

1.2.1 Status

NC Act – Vulnerable

1.2.2 Biology and ecology

1.2.2.1 Characteristic

Slender milkvine (*Marsdenia coronata*) is a herbaceous vine with tuberous roots. Its stems are cylindrical, up to 1.5 mm in diameter and exuding white latex when cut. Leaves are on stalks 2 to 7 mm long. The leaf blades are linear to lance-shaped, up to 5.5 cm long and 1 cm wide, wedge-shaped to rounded at the base with an acute apex. Flowers are on stalks 4.6 to 8 mm long, arising in a cluster at the end of a common stalk (refer Photograph 1.2). The corolla is shallowly bell-shaped, yellow to yellow-green, the basal part a tube 2.6 to 3 mm long, separating above the tube into triangular lobes 1.6 to 2 mm long and bent sharply downwards. Fruits are dry, spindle-shaped to egg-shaped, approximately 10 cm long (Forster 1995; 1996).

Photograph 1.2 Slender milkvine (*Marsdenia coronata*)

Source: Shields (2016)

1.2.2.2 Known distribution

Slender milkvine occurs in southeast Queensland, where it is commonly found in eucalypt forest or, at Mount Coolum, in open grassland among rocks. Scattered populations occur from the Gunalda Range, north of Gympie, south to the Great Dividing Range near Killarney (Forster 1995; Halford 1998) (refer Figure 1.3).

Figure 1.3 Distribution range of the Slender milkvine

Source: ALA (2020)

1.2.2.3 Distribution in relation to the project

Marsdenia coronata was identified during field surveys (GHD 2016) within the ecology study area and approximately 30 m north of the disturbance footprint at the eastern extent of the Project. Also recorded along a ridgeline approximately 300 m north of the southern access road footprint. Database records (i.e. AoLA and WildNet) indicate two records of *Marsdenia coronata* occurring within the ecology study area in Purga Creek Nature Reserve (2001) and south of Flinders Peak (2017) (refer Figure 1.4). There are also several records to the north of the ecology study area (within 3 km) in the Flinders Peak/Ivory Rock area. This species was not detected during previous flora surveys at the site. This species has not been detected during field investigations that have been carried out at the site.

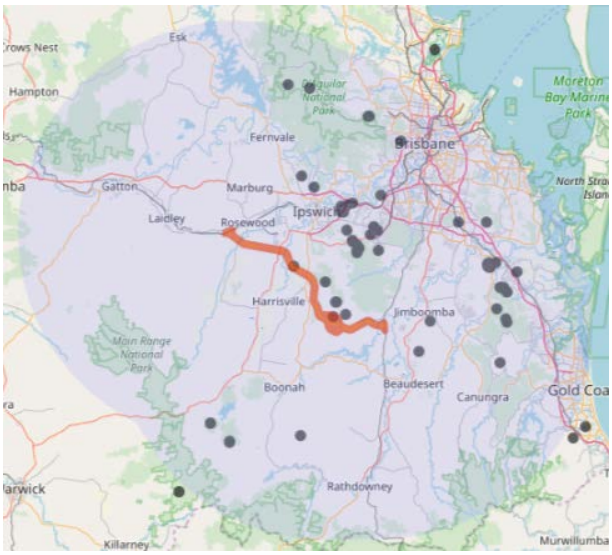

Figure 1.4 Distribution range of the Slender milkvine in relation to the Project

Source: ALA (2020)

1.2.2.4 Biology and reproduction

Flowering occurs from November to March, and fruiting occurs three to four months later (Forster 1996).

1.2.3 Habitat

Slender milkvine commonly grows in rainforest, rainforest margins or moist areas of open forest, especially in eucalypt forest. Also recorded from an area of natural grassland on the top of Mt Kandanga, Imbil State Forest. The vine has been found between 40 and 780 m above sea level, and usually occurs on sandstone or stony soils (Borsboom and Wang 1996).

1.2.4 Threatening processes

The following have been identified as potentially threatening processes to Slender milkvine:

- Destruction of habitat due to clearing and development and mining
- Inappropriate fire regimes (Borsboom and Wang 1996; Forster 1995).

1.2.5 Threat abatement/recovery plans

No threat abatement or recovery plan has been identified as being relevant for this species (DOEE 2018).

1.2.6 References

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1.3 Swamp tea-tree (*Melaleuca irbyana*)

1.3.1 Status

EPBC Act – Not listed

NC Act – Endangered

1.3.2 Biology and ecology

1.3.2.1 Characteristic

The Swamp tea-tree (*Melaleuca irbyana*) is a small tree growing to 8 m in height (refer Photograph 1.3). The bark is papery and white to pale brown. The leaves on the indeterminate shoots are narrowly ovate in shape, 4 to 5 mm long, 1 to 1.5 mm wide and narrow gradually to a pointed tip. The leaves on the determinate shoots are more angular-ovate in shape, 2 to 3 mm long, 1 to 1.5 mm wide, are inserted in shallow hollows on the stem and have prominent dark glands in 4 to 6 rows. The flowers are in 6 to 12 bundles of three, each 10 to 25 mm long and with 8 to 12 white or cream coloured stamens per bundle. The fruits are 3 to 3.5 mm long and 3.5 to 4 mm wide (Barlow 1987; Byrnes 1984).

Photograph 1.3 Swamp tea-tree (*Melaleuca irbyana*)

Source: Bennett (2017)

1.3.2.2 Known distribution

It only occurs in southeast Queensland and north-eastern New South Wales. In Queensland it can be found in the local government areas of Beaudesert, Boonah, Logan, Ipswich, Laidley and Esk and in NSW the Casino district (ALA 2018) (refer Figure 1.5).

Figure 1.5 Distribution range of Swamp tea-tree

Source: ALA (2020)

1.3.2.3 Distribution in relation to the project

Melaleuca irbyana has been identified as occurring within the ecology study area of the Project. Database records (i.e. AoLA and WildNet) indicate that *Melaleuca irbyana* has been identified from within 200 m of the disturbance footprint recently (2018) (refer Figure 1.6). Multiple specimen backed records occur from within the ecology study area and from within 50 km of the disturbance footprint to the west, north-west, north, north-east and east. This species was detected during field investigations by Aecom in 2010, confirmed in surveys by Jacobs-GHD in 2016 and again by EMM/Eco Logical in 2018 where the species was detected at Ebenezer and Willowbank.

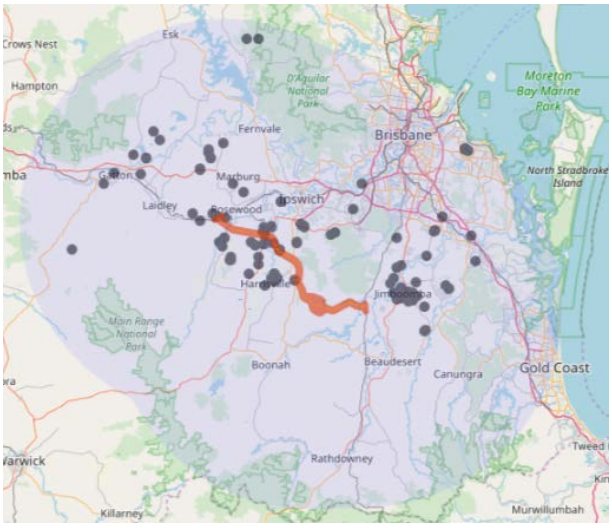

Figure 1.6 **Distribution range of Swamp tea-tree in relation to the Project**

Source: ALA (2020)

1.3.2.4 Biology and reproduction

It flowers mainly from September to January and research shows that the low survival rates and slower growth rates of seedlings in natural environments of Swamp tea-tree may contribute to explaining its original restricted distribution (Barlow 1987; Soonthornvipat 2018).

1.3.3 Habitat

It grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and Melaleuca woodland with a sparse and grassy understorey. It grows on poorly draining, heavy clay soils (Barlow 1987; Byrnes 1984).

1.3.4 Threatening processes

The following have been identified as potentially threatening processes to Swamp tea-tree.

- Clearing or modification of habitat
- Feral animals
- Weed invasion (Soonthornvipat 2018).

1.3.5 Threat abatement/recovery plans

No threat abatement has been identified as being relevant for this species. The following program has been identified as being relevant to this species:

- Office of Environment and Heritage (2016), *Saving our Species Programme*. Available from https://www.environment.nsw.gov.au/savingourspeciesapp/project.aspx?ProfileID=10518. In effect under the BC Act 2016.

1.3.6 Summary of threat abatement/recovery plan

Melaleuca irbyana is assigned as a site-managed species under the NSW *Saving our Species Program*. The conservation strategy for identifies three priority management sites:

- Braemar State Forest in Richmond Valley LGA
- Warragai Creek Nature Reserve in Clarence Valley LGA
- Glenugie State Forest in Clarence Valley LGA.

Threats identified at the management sites include:

- Vegetation clearing from plantation development and logging activtieis
- Invasion of habitat by weed, particularly introduced grasses.

Management activities to protect this species at the sites are:

- Prevent clearing species and species habitat through monitoring for direct disturbance and liaising with Forestry Corporation of NSW to minimise logging
- Reduce and maintain weed densities at low levels
- Track species abundance and condition over time.

1.3.7 References

Atlas of Living Australia (2018). *Melaleuca irbyana*. Available from: https://bie.ala.org.au/species/http://id.biodiversity.org.au/node/apni/2900861 [Accessed 7 September 2018].

Barlow, B.A. (1987). Contributions of a revision of *Melaleuca* (Myrtaceae). *Brunonia* 9(2): 173.

Bennett M. (2017). *Melaleuca irbyana*. (Image) [Online] Available from: https://bie.ala.org.au/species/http://id.biodiversity.org.au/node/apni/2900861 [Accessed 7 September 2018].

Byrnes, N.B. (1984). A revision of *Melaleuca* L. (Myrtaceae) in northern and eastern Australia, 1. *Austrobaileya* 2(1): 72.

Soonthornvipat, T. (2018). 'Comparative ecophysiological analyses of melaleuca irbyana and melaleuca bracteata – a narrowly versus widely distributed congeneric species'. Thesis, QUT, Brisbane.

2 Fauna – Threatened species – Birds

2.1 Glossy black-cockatoo (*Calyptorhynchus lathami lathami*)

2.1.1 Status

EPBC Act – Not listed

NC Act – Vulnerable

2.1.2 Biology and ecology

2.1.2.1 Characteristic

The Glossy black-cockatoo (*Calyptorhynchus lathami lathami*) is a small black cockatoo that is approximately 46 to 51 cm in length with a wingspan of 90 cm, a tail 21 to 23 cm and an inconspicuous crest and broad bulbous bill. Adult males have solid bright red panels in the ventral surface of their tail feathers, while females have light orange-red panels with black barring (refer Photograph 2.1). Females also have irregular patches of yellow on the head and neck. Immature individuals also have irregular patches of yellow on the head and wing coverts. Tail barring in males is lost in successive moults as the panels become bright red (Pizzey and Knight 2007; Schodde et al. 1993).

The Glossy black-cockatoo is distinguished from the Red-tailed (*C. banksii*) and Yellow-tailed (*C. funereus*) black-cockatoo by its' smaller size, dull brown tinge to the head and breast, inconspicuous crest, and red rather than yellow panels in the tail (Glossy Black Conservancy 2010).

Photograph 2.1 Glossy black-cockatoos (*Calyptorhynchus lathami lathami*)

Source: Claridge (2016)

2.1.2.2 Known distribution

The Glossy black-cockatoo has a widespread distribution, ranging from Gympie to the southeast Queensland border, inland to Augathella and Tambo (refer Figure 2.1). The distribution continues south into NSW spreading inland to the Central Western Plains of NSW and also into eastern Victoria (Schodde et al. 1993).

Figure 2.1 **Distribution range of Glossy black-cockatoo**

Source: ALA (2020)

2.1.2.3 Distribution in relation to the project

Calyptorhynchus lathami has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA) indicate that this species has been recorded from within approximately 10 km of the disturbance footprint from 1990 near Rosewood to the north-east of the Project and more recently (2015) to the west of the Project near Grandchester (refer Figure 2.2). Other records for this species occur in all directions around the Project. Feeding sign indicating the presence of Glossy black-cockatoo was discovered during field investigations carried out by Jacobs-GHD in 2016.

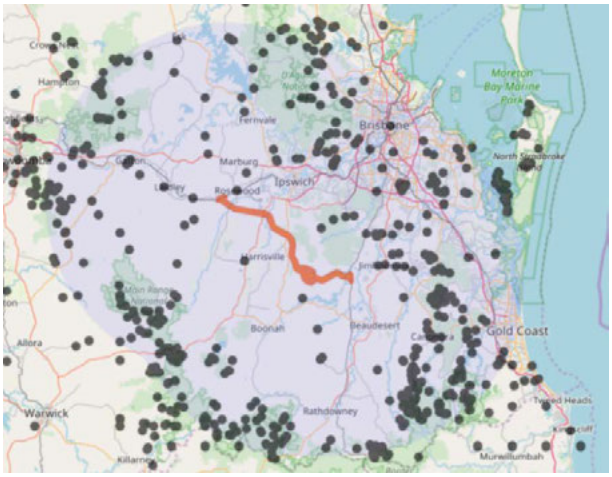

Figure 2.2 **Distribution range of Glossy black-cockatoo in relation to the Project**

Source: ALA (2020)

2.1.2.4 Biology and reproduction

The Glossy black-cockatoo feed almost exclusively on the seeds of species of *Allocasuarina* and *Casuarina* species throughout their range. In addition, within an area, feeding is often restricted to one or two individuals of a single species. This species also shows a strong fidelity to particular feed trees, returning to selected trees over consecutive years (Cameron 2005; Cameron and Cunningham 2006; Clout 1989).

Below are species that Glossy black-cockatoo's are known to feed on:

- *Allocasuarina torulosa*
- *Casuarina equisetifolia*
- *A. littoralis*
- *A. verticillata*

- *C. cristata*
- *C. pauper*
- *A. gymnanthera*
- *A. diminuta* (OEH 2017).

Glossy black-cockatoos are dependent on large hollow-bearing eucalypts for nesting. Hollows used for nests are typically located 10 to 20 m above the ground, in vertical or near vertical branches, stems, and spouts, or in trunk cavities. The same nest will be utilised in successive seasons, and they are known to often nest in close proximity to other nesting pairs. The peak breeding season occurs from March to August in southeast Queensland and north-eastern NSW and clutch size is typically comprised of a single egg (Cameron 2006; Garnett et al. 1999; Glossy Black Conservancy 2010; Pizzey and Knight 2007).

2.1.3 Habitat

The Glossy black-cockatoo prefers woodland areas dominated by she-oak (*Allocasuarina* spp.), or open sclerophyll forests/woodlands with a stratum of *Allocasuarina* spp. beneath a canopy of *Eucalyptus* spp., *Corymbia* spp. or *Angophora* spp. Glossy black-cockatoos have also been recorded in mixed *Allocasaurina*, *Casuarina*, *Callitris* and *Acacia harpophylla* woodland assemblages. In southeast Queensland, west of the Great Dividing Range, they have been observed feeding in remnant Belah (*Casuarina cristata*) and Bulloak (*Allocasuarina luehmannii*) forests (Glossy Black Conservancy 2010).

2.1.4 Threatening processes

The following have been identified as potentially threatening processes to Glossy black-cockatoo:

- Reduction of suitable habitat through clearing for development
- Decline of hollow bearing trees over time due to land management activities
- Excessively frequent fire which eliminates sheoaks, depleting habitat and feed trees
- Limited information on the location of nesting aggregations and the distribution of high quality breeding habitat
- Disturbance from coal seam gas and open cut coal mining causing loss of foraging and breeding habitat as well as disturbing reproductive attempts
- Illegal bird smuggling and egg-collecting (OEH 2017).

2.1.5 Threat abatement/recovery plans

The following threat abatement/recovery plans have been identified as being relevant for this species.

- Office of Environment and Heritage (2017). Save Our Species: Help save the Glossy Black-Cockatoo. New South Wales Government. Available from: https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=1178&ReportProfileID=10140. In force under the *Biodiversity Conservation Act 2016*.

2.1.6 Summary of threat abatement/recovery plan

Threats identified in the Saving our Species plan includes:

- Loss of existing and future hollow-bearing trees
- Excessively frequent fires eliminating sheoaks from an area and preventing their development to maturity
- Reduced access to water in close proximity to foraging and nesting habitat
- Loss of habitat through clearing for development
- Global climate change impacting the spatial and temporal distribution of the species

Management actions outline in the Saving our Species plan includes:

- Raise awareness around the importance of large old trees, which provide roosting habitat
- Protect large and small hollow bearing trees to facilitate regenerations of habitat trees
- Encourage the retention of sheoaks in the understorey and reduce impact caused by fire, slashing/underscrubbing and over-grazing
- Maintain accessibility to surface water or provide artificial sources of water ensuring vegetation cover is maintained between roosting/foraging sites and water sources
- Raise awareness among landholders on the importance of suitable habitat for the species
- Install nest boxes to provide artificial nesting sites for the species
- Enhance and restore corridors between woodland and forest habitat.

2.1.7 References

Atlas of Living Australia (2018). *Calyptorhynchus (Calyptorhynchus) lathami lathami*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:61461228-28c3-4174-ab6e-ac5a57daf4f9#overview [Accessed 3 September 2018].

Cameron, M. and Cunningham, R. B. (2006). Habitat selection at multiple spatial scales by foraging glossy black-cockatoos. *Austral Ecology* 31, 597-607.

Cameron, M. (2005). Group size and feeding rates of glossy black-cockatoos in central New South Wales. *Emu* 105, 299-304.

Cameron, M. (2006). Nesting habitat of the glossy black-cockatoo in central New South Wales. *Biological Conservation* 127, 402-410.

Claridge G. (2016). Glossy Black-Cockatoo (Image) [Online] Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:61461228-28c3-4174-ab6e-ac5a57daf4f9#gallery [Accessed 3 September 2018].

Clout, M.N. (1989). Foraging behaviour of glossy black-cockatoos. *Australian Wildlife Research* 16, 467-473.

Garnett, S. T., Pedler, L. P. and Crowley, G. M. (1999). The breeding biology of the glossy black-cockatoo *Calyptorhynchus lathami* on Kangaroo Island, South Australia. *Emu* 99, 262-279.

Glossy Black Conservancy (2010). *Glossy black-cockatoo Conservation Guidelines for Southeastern Queensland and far North-Eastern New South Wales*. Glossy Black Conservancy.

Office of Environment and Heritage, NSW (2017). Glossy Black-Cockatoo. Available from: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10140 [Accessed 3 September 2018].

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

Schodde, R., Mason, I.J. and Wood, J.T. (1993). Geographical differentiation in the glossy black-cockatoo *Calyptorhynchus lathami* (Temminck) and its history. *Emu* 93, 156-166.

2.2 Powerful owl (*Ninox strenua*)

2.2.1 Status

EPBC Act – Not listed

NC Act – Vulnerable

2.2.2 Biology and ecology

2.2.2.1 Characteristics

The Powerful owl (*Ninox strenua*) is the largest species of owl in Australia measuring 60 to 66 cm in total body length with a wingspan of 120 to 140 cm. The owl has large yellow eyes, no facial-disc with the upper body dark greyish-brown in colour with a mottled barred white lower body. The underside of the owl is whitist with dark grey-brown chevron markings (refer Photograph 2.2). Juvenile Powerful owls have a white crown and underpart contrasting its small, dark streaks and dark eye patches. Female Powerful owls have a smaller body size compared to the male, as well as a narrower head (OEH 2017; Pizzey and Knight 2007).

Photograph 2.2 Powerful owl (*Ninox strenua*)

Source: ALA (2018)

2.2.2.2 Known distribution

The Powerful owl is endemic to both eastern and south-eastern Australia and inhabits the coastal side of the Great Dividing Range from Mackay to southwestern Victoria (refer Figure 2.3). In NSW the species exists in low densities through the eastern range and along the Murray River despite once being widely distributed throughout the eastern forests to the tablelands. In Queensland, the owl's possible known distribution extends from Bowen to the NSW border through southeast Queensland. Records have also suggested the species has been known to occupy suburban areas of Brisbane, Sydney and Melbourne (Birdlife International 2016; OEH 2017; Pizzey and Knight 2007).

Figure 2.3 Distribution range of the Powerful owl

Source: ALA (2020)

2.2.2.3 Distribution in relation to the project

Ninox strenua has been identified within the ecology study area from database records (i.e. AoLA, WildNet) in 2011. Other records for this species occur within 10 km of the disturbance footprint from Koala Crossing Nature Reserve and Stewartdale Nature Refuge (refer Figure 2.4). Records for this species occur in all directions around the disturbance footprint. Powerful owl was detected during nocturnal call playback surveys during field investigations carried out by Aecom in 2010.

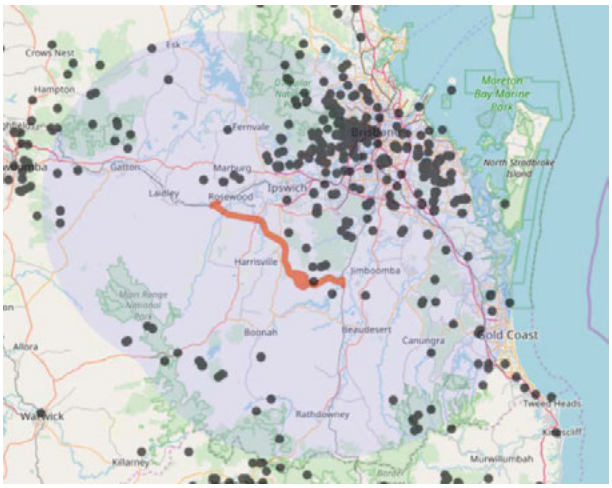

Figure 2.4 **Distribution range of the Powerful owl in relation to the Project**

Source: ALA (2020)

2.2.2.4 Biology and reproduction

The Powerful owl's main prey is dependent on habitat. However, medium-sized arboreal marsupials such as the Greater glider, Common ringtail possum and the Sugar glider constitutes much of its diet. Smaller bird species are an alternative prey to mammals for the owl species making up 10 to 50% of their diet (OEH 2017).

The Powerful owl forms long-lasting monogamous bonds which are maintained over the species lifetime, with new breeding bonds being formed only after the death of a mate. Breeding typically occurs from late autumn to mid-winter with pairs in north-eastern NSW breeding earlier in late summer to mid-autumn. Nests are made in large tree hollows at least 0.5m deep usually in large eucalyptus trees which are at least 150 years old. Clutch size is typically two dull white coloured eggs with an incubation period lasting approximately 38 days. As the female and young remain in the nest, the male will roost nearby between 10 to 200 m away guarding them whilst concealed in trees (OEH 2017; Pizzey and Knight 2007).

2.2.3 Habitat

The Powerful owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The species requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. It roosts by day in dense vegetation comprising species such as Turpentine (*Syncarpia glomulifera*), Black she-oak (*Allocasuarina littoralis*), Blackwood wattle (*Acacia melanoxylon*), Rough-barked apple (*Angophora floribunda*), Scrub cherry (*Exocarpus cupressiformis*) and a number of Eucalypt species. Hollows and shrub layers are important habitat components for the Powerful owl who demonstrate high fidelity to a large territory with the size dependent on habitat quality and prey density (OEH 2017).

2.2.4 Threatening processes

The following have been identified as potentially threatening processes to the Powerful owl:

- Fragmentation of suitable habitats resulting from land clearing for rural and agricultural uses
- Inappropriate forest harvesting practices

- High frequency burning
- Predation of chicks by foxes, dogs and cats (OEH 2017).

2.2.5 Threat abatement/recovery plans

The following threat abatement/recovery plan has been identified as being relevant for this species.

- Office of Environment and Heritage (2017). Saving our Species: Help save the Powerful Owl. New South Wales Government. Available: https://www.environment.nsw.gov.au/savingourspeciesapp/ViewFile.aspx?ReportProjectID=712&ReportProfileID=10562. In force under the *Biodiversity Conservation Act 2016.*

2.2.6 Summary of threat abatement/recovery plan

Threats identified in the Saving our Species plan includes:

- Previous loss and fragmentation of woodland habitat for residential and agricultural development
- Habitat loss reducing the availability of prey species, particularly the Greater glider
- Prey availability reduced as a result of high frequency hazard reduction burns

Actions for this species outlined in the plan include:

- Compile available information, knowledge and assessment protocols to create a consensus of best practice guidelines
- Provide a single point resource for land managers to reference keeping it updated regularly
- Increase public interest through a novel educational framework
- Negotiate agreements with landholders to enter into stewardship agreements that promote retention of large old trees, riparian habitat, owl roost sites and other high value habitat
- Improve habitat quality and connectivity focusing on the restoration of arboreal habitat specific to mammalian prey
- Create wide corridors, particularly in areas such as riparian areas which are more productive for prey species due to abundant resources and soil fertility
- Install artificial hollows in high priority owl populations for both the owls and their prey. If effectiveness is demonstrated expand this as an education tool for the public highlighting the impact of the loss of hollow bearing trees
- Encourage the development of citizen science programs to increase community engagement in urban areas to create broader conservation awareness for powerful owls
- Identify known nests to ensure that no habitat degradation occurs within 100 m and facilitate the location of new nest sites.

2.2.7 References

Atlas of Living Australia (2018). *Ninox* (Rhabdoglaux) *strenua*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:c303a58c-ffb9-4bf6-a71b-5e22299c5ee2#overview [Accessed 2 September 2018].

BirdLife International (2016). *Ninox strenua*. The IUCN Red List of Threatened. Available from: http://www.iucnredlist.org/details/22689389/0 [Accessed 22 August 2018].

Office of Environment and Heritage (2017). Powerful Owl - Profile. New South Wales Government. Available from: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10562 [Accessed 2 September 2018].

Pizzey, G. and Knight, F. (2007). The Field Guide to the Birds of Australia. Harper Collins publishing. Sydney.

2.3 Tusked frog (*Adelotus brevis*)

2.3.1 Status

EPBC Act – Not listed

NC Act – Vulnerable

2.3.2 Biology and ecology

2.3.2.1 Characteristics

The Tusked frog is a ground dwelling medium sized frog that can reach a length of 50 mm snout-vent length (SVL). Colouration of the species consist of dark brown, grey and light brown patches with darker variations throughout the pattern across the back and the skin is rough in texture (Cogger 2000, Hines 2012). A butterfly-like dark pattern is present over the head and between the eyes of the species (Robinson 1993, Hines 2012). The underside is smooth with mottled white, grey and black colouration. The groin and inner thighs of the legs have a marbled bright red and black colouration (Meyer et al. 2001). Sexual dimorphism is present within the species with males reaching a larger body size compared to females with heads that are also broader and flatter. Both sexes possess a pair of tusks, in which the name is derived from, that are present on the front of the lower jaw seen only when the mouth is opened (Robinson 1993, Katsikaros and Shine 1997, Cogger 2000, Meyer et al. 2001, Hines 2012).

Photograph 2.3 Tusked frog (*Adelotus brevis*)

Source: Brown (2011)

2.3.2.2 Known distribution

The Tusked frog distribution extends from Clarke Range and Shoalwater Bay in mid-east Queensland to Moss Vale in mid-east New South Wales (Hines et al. 1999; Hines et al. 2004; Hines 2012). Populations occur at locations in central Queensland at Blackdown Tableland and Carnarvon Gorge (Hines et al. 2004; Hines 2012), and in Barakula State Forest (WildNet 2012). The species previously occurred around the New England Tablelands and Bunya Mountains but are thought to be locally extinct whilst the Scenic Rim populations has declined significantly with losses attributed to amphibian chytrid fungus (Hines et al. 1999; Hines et al. 2004; Hines 2012). The species is however persisting in areas where suitable habitat exists in the lowlands and foothills east of the Great Dividing Range (Meyer et al. 2001; Hines 2012).

Figure 2.5 **Distribution range of the Tusked frog**

Source: ALA (2020)

2.3.2.3 Distribution in relation to the project

Tusked frog has not been recorded from within the ecology study area or within the disturbance footprint. The Project comprises of 4.15h ha of suitable habitat for the species. The nearest database records for the species occur approximately 6.5 km north of the disturbance footprint at Teviot Range (near Mount Elliot). One of these records is old (1961) whilst the other is more recent (2011) (refer Figure 2.4). Most database records within a 50 km buffer of the disturbance footprint occur within or close to national parks and forest reserves at Main Range, Lockyer Valley, D'Aguilar, Gold Coast hinterland and Mount Barney. These are most concentrated between Brisbane and surrounds as well as Gold Coast hinterland. This species has not been detected during field investigations that have been carried out at the site.

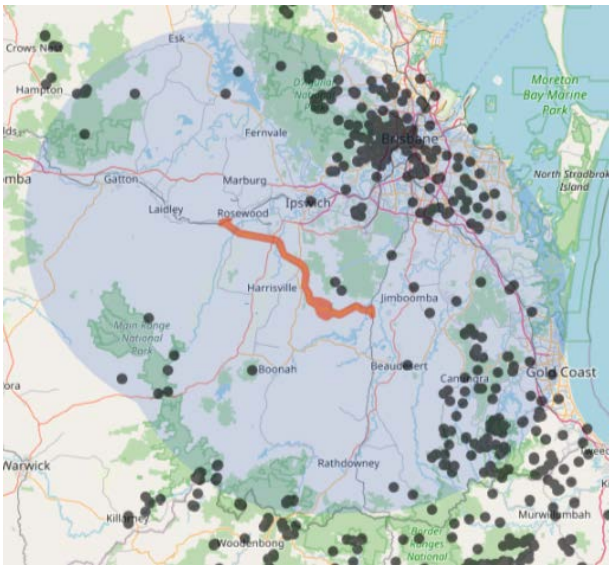

Figure 2.6 **Distribution range of the Tusked frog in relation to the Project**

Source: ALA (2020)

2.3.2.4 Biology and reproduction

Males of the species use their shar 'tusks' as a mechanism to defend territory. During the spring and summer months males will make repeated calls in order to attract females whilst they float in water. Whilst in the water they will hide amongst aquatic vegetation or shelter amongst rocks and wooden debris. A floating foam nest is produced by the males in a shady place in which the females will lay her eggs. The males will then defend the nest until the eggs hatch. Tadpoles undergo metamorphosis after a period of between two and three months at which stage they are around 3.5 cm in length (AoLA 2020).

2.3.3 Habitat

This species will typically occupy wet eucalypt forest and rainforest however, it can occasionally be found in dry eucalypt forest. They occupy areas of forest that are within close proximity to suitable breeding habitat provided by ponds and streams where water moves at a slower rate (Cogger 2000, Meyer et al. 2001, Hines 2012). Records have also been noted from artificial structures such as dams and urban environments in garden pond (Hines 2012).

2.3.4 Threatening processes

The following have been identified as potentially threatening processes to the Tusked frog:

- The biggest cause of decline for the species is probably from chytridiamycosis – amphibian chytrid fungus
- Degradation of habitat and water quality as a result of agricultural development and urban expansion
- Invasive aquatic fauna such as the Eastern mosquitofish, *Gambusia holbrooki* and aquatic weeds altering the vegetation composition of their natural habitat (AoLA 2020).

2.3.5 Threat abatement/recovery plans

The following threat abatement/recovery plan has been identified as being relevant for this species.

- Department of Agriculture, Water and the Environment (2002). Recovery plan for stream frogs of south-east Queensland 2001-2005.

2.3.6 Summary of threat abatement/recovery plan

No threat abatement/recovery plan has been identified for this species.

The Threat Abatement Plan for infection of amphibians with chytrid fungus resulting in chytridiomycosis has been identified as being relevant for this species.

Actions outlined in the plan include:

- Better understand the impacts infection from the fungus has on amphibians and how to reduce the spread to areas where the fungus has not yet reached
- Prioritise species that are most at threat at the population level and across geographical areas implementing cost-effective on-ground management strategies
- Facilitate research in order to improve management of the fungus
- Improve the capacity of scientific research and communication amongst stakeholders (DotEE 2016).

2.3.7 References

Atlas of Living Australia. (2020). Adelotus brevis (Günther, 1863). Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:32f57cc7-5690-4018-98fb-6c924c72e53a#cite_note-EDGE-2. [Accessed: 24 April 2020].

Brown, W. (2011). Image: Tusked frog, Adelotus brevis. Available from: https://www.flickr.com/photos/37428634@N04/6317506189. [Accessed: 24 April 2020]

Cogger, H. G. (2000). Reptiles and amphibians of Australia. Reed New Holland: Sydney.

Department of the Environment and Energy. (2016). Threat Abatement Plan for infection of amphibians with chytrid fungus resulting in chytridiomycosis. Available from: http://www.environment.gov.au/system/files/resources/d7506904-8528-411e-a3f4-19d4379935f9/files/tap-chytrid-fungus-2016.pdf. [Accessed: 24 April 2020].

Hines, H. B. (2012). Tusked frog, Adelotus brevis. In ‘Queensland's Threatened Animals’ (Eds L. K. Curtis, A. J. Dennis, K. R. McDonald, P. M. Kyne and S. J. S. Debus) pp. 132-133. CSIRO Publishing: Collingwood.

Katsikaros, K. and Shine, R. (1997). Sexual dimorphism in the tusked frog, Adelotus brevis (Anura: Myobatrachidae): the roles of natural and sexual selection. Biological Journal of the Linnean Society

60, 39-51.

Meyer, E., Hines, H. and Hero, J-M. (2001). ‘Wet forest frogs of south-east Queensland’. Griffith University: Queensland.

Robinson, M. (1993). ‘A field guide to frogs of Australia’. Reed New Holland: Chatswood.

WildNet (2012). Species profile—Adelotus brevis (tusked frog). Available from: https://apps.des.qld.gov.au/species-search/details/?id=706#. [Accessed: 24 April 2020].

3 Fauna – Migratory species – Birds

3.1 Black-faced monarch (*Monarcha melanopsis*)

3.1.1 Status

EPBC Act – Marine and Migratory (Bonn)

3.1.2 Biology and ecology

3.1.2.1 Characteristic

The Black-faced monarch (*Monarcha melanopsis*) is approximately 16.5 to 19 cm long weighing in at about 21 to 29 g. It has a pale bill with a black forehead and throat surrounding the bill. It has a grey upper breast that contrasts with the rich rufous underparts below and dark grey tail (refer Photograph 3.1). The immature form exhibits a darker bill lacking the black forehead and throat. The voice is a fussy, wheezy chattering with a main harsh call similar to 'Why-you, which-you' along with drawn out 'wheech you' and slurred 'r, r, rerr' or 'shsh-shsh-shirr' sounds (Pizzey and Knight 2007).

Photograph 3.1 Black-faced monarch (*Monarcha melanopsis*)

Source: Mansfield (2016)

3.1.2.2 Known distribution

The Black-faced monarch is widespread in eastern Australia (refer Figure 3.1) (Blakers et al. 1984). In Queensland, it is widespread from the islands of the Torres Strait and on Cape York Peninsula, south along the coasts and the eastern slopes of the Great Divide, to the NSW border (Beruldsen 1990; Blakers et al. 1984).

The Black-faced monarch is also recorded in Papua New Guinea and New Zealand (Coates 1990a).

Figure 3.1 **Distribution range of the Black-faced monarch**

Source: ALA (2020)

3.1.2.3 Distribution in relation to the project

Database records (i.e. AoLA and WildNet) indicate that *Monarcha melanopsis* has been identified as occurring within the ecology study area with a record existing from 2002 between the disturbance footprint and Harrisville (refer Figure 3.2). Historical records for this species exist in all directions around the Project. This species has not been detected during field investigations that have been carried out at the site.

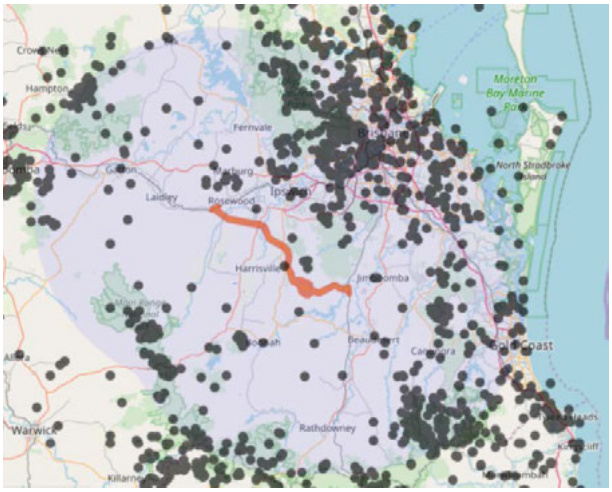

Figure 3.2 **Distribution range of the Black-faced monarch in relation to the Project**

Source: ALA (2020)

3.1.2.4 Biology and reproduction

The Black-faced monarch is known to eat a large variety of arthropods, including: spiders, beetles, grasshoppers, flies, moths etc. They forage at all vertical levels of the forest, though most often at low or middle levels, within 6 m of the ground (Blakers et al. 1984).

The Black-faced monarch breeds in rainforest habitat, and generally nests near the top of trees with large leaves, in the tops of small saplings, or in lower shrubs. They breed from October to March, with eggs recorded mostly from November to mid-January. There is a variation in egg-laying seasons with southeast Queensland eggs laid from October to December and possibly into January and in NSW eggs have been recorded from October to February. The incubation period is thought to be 13 to 15 days and the fledging period approximately 7 days or slightly more. The species appears to have a relatively high rate of fledging failure, with analyses of hatching and fledging success indicating that an average of 0.1 fledged young is yielded per nest per breeding event (BA NRS 2002, Marchant 1986).

3.1.3 Habitat

The Black-faced monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical rainforest, subtropical rainforest, mesophyll thicket/shrubland, warm temperate rainforest, dry rainforest and cool temperate rainforest (Blakers et al. 1984).

The species also occurs in selectively logged and 20 to 30 years old regrowth rainforest and 'marginal' habitats during winter or during migration. Other areas include gullies in mountain areas or coastal foothills, softwood scrub dominated by Brigalow and coastal scrub dominated by Coast Banksia (Blakers et al. 1984; Laurance et al. 1996).

3.1.4 Threatening processes

There are currently no known serious threatening processes that have been identified for the Black-faced monarch.

3.1.5 Threat abatement/recovery plans

The following threat abatement plan has been identified as being relevant for this species:

- Department of the Environment (2015). Threat abatement plan for predation by feral cats. Canberra, ACT: Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats. In effect under the EPBC Act from 23-Jul-2015.

3.1.6 Summary of threat abatement/recovery plan

Threats identified in the Threat abatement plan for predation by feral cats include:

- Predation on native species causing a critical decline in many species across animal groups
- Competition for food with species they share dietary overlap and disease transmission
- Contributed to the extinction of many ground nesting bird species and the decline of small mammals.

Threat abatement actions for feral cats include:

- Effectively control cats in different landscapes
- Improve effectiveness of existing control measures for feral cats
- Develop and maintain alternative strategies for the recovery of threatened species
- Gain public support for feral cat management and promote responsible cat ownership.

3.1.7 References

Atlas of Living Australia (2018). *Monarcha melanopsis*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:21ebd2d3-f706-4997-b04a-79e5d023dcb3#overview [Accessed 27 August 2018].

BA NRS (2002). *Birds Australia Nest Record Scheme*. Available from: http://birdlife.org.au/projects/atlas-and-birdata/nest-record-scheme

Beruldsen, G.R. (1990). Cape York in the wet. *Australian Bird Watcher*. 13:209-217.

Blakers, M., Davies S.J.J.F. and Reilly P.N. (1984). *The Atlas of Australian Birds*. Melbourne, Victoria: Melbourne University Press.

Coates, B.J. (1990). *The Birds of Papua New Guinea Including the Bismarck Archipelago and Bougainville. Volume 2 Passerines*. Alderley, Queensland: Dove Publications.

Department of the Environment and Energy (2018). *Monarcha melanopsis* in Species Profile and Threats Database, Department of the Environment and Energy, Canberra. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies. [Accessed 24 August 2018].

Laurance, W.F., Gordon C.E. and Perry E. (1996). Structure of breeding bird communities in rainforest and regrowth forest in tropical Queensland. *Sunbird*. 26:1-15.

Mansfield N. (2016). *Monarcha melanopsis* (Image) [Online] Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:21ebd2d3-f706-4997-b04a-79e5d023dcb3#gallery [Accessed 27 August 2018].

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

3.2 Common sandpiper (*Actitis hypoleucos*)

3.2.1 Status

EPBC Act – Marine and Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)

3.2.2 Biology and ecology

3.2.2.1 Characteristic

The Common sandpiper (*Actitis hypoleucos*) is approximately 19 to 22cm long. It has a fine, brown bill with a buff base and whitish eyebrows and eye-rings. The legs are grey-green and tinged yellow. It is bronze-brown to grey-brown above with fine dark barring and distinct white hook around the bend of the closed wing leading to a white underside. The sides of the upper breast are washed brown (refer Photograph 3.2). Immature individuals have more distinct darker barring on the upper parts (Pizzey and Knight 2007).

Photograph 3.2 Common sandpiper (*Actitis hypoleucos*)

Source: Kurek (2017)

3.2.2.2 Known distribution

The Common Sandpiper breeds in Europe and Asia. In Australasia it visits New Guinea and Australia. In Australia, the species is most commonly found in the north, east and west from August to May (refer Figure 3.3) (Pizzey and Knight 2007).

Figure 3.3 **Distribution range of the Common sandpiper**

Source: ALA (2020)

3.2.2.3 Distribution in relation to the project

Actitis hypoleucos has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA, WildNet) indicate that this species exists approximately 20 km to the west of the disturbance footprint in Laidley with the observation recorded in 2017 (refer Figure 3.4). There are other records for this species to the north-west of the Project, although most occur to the south-east, east and north-east closer to the coast. This species has not been detected during field investigations that have been carried out at the site.

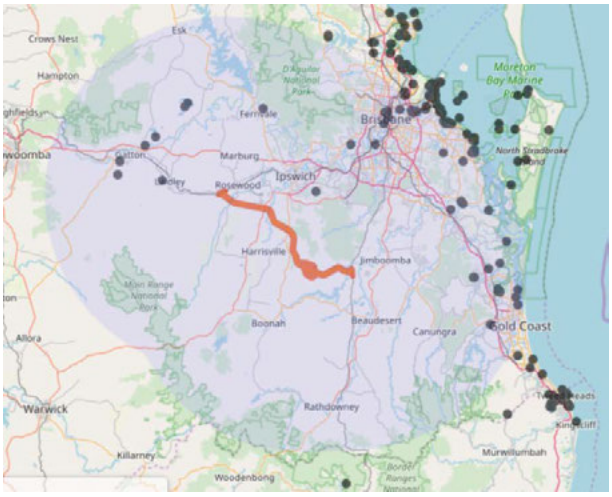

Figure 3.4 **Distribution range of the Common sandpiper in relation to the Project**

Source: ALA (2020)

3.2.2.4 Biology and reproduction

In Australia, the Common sandpiper is typically carnivorous, eating molluscs such as bivalves, crustaceans and a variety of insects (Higgins & Davies 1996).

This species does not breed in Australia. Breeding mostly occurs in the British Isles, Japan and eastern Siberia (Pizzey and Knight 2007).

3.2.3 Habitat

In Australia, Common sandpipers are found in shallow, pebbly, muddy or sandy edges of rivers and streams. They are found in coastal to inland areas, recorded in dams, lakes, sewage ponds, margins of tidal rivers, mangrove forests, saltmarshes, mudflats, beaches and drains (Pizzey and Knight 2007).

3.2.4 Threatening processes

The following have been identified as potentially threatening processes to the Common sandpiper:

- Habitat changes
- Regulation of rivers
- Pollution
- Use of pesticides (reducing prey abundance, especially in breeding periods) (Cramp & Simmons 1983).

3.2.5 Threat abatement/recovery plans

No recovery plan has been identified as being relevant for this species.

The following Wildlife Conservation Plan has been identified as being relevant for this species:

- Commonwealth of Australia (2015). Wildlife Conservation Plan for Migratory Shorebirds. Canberra, ACT: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/publications/wildlife-conservation-plan-migratory-shorebirds-2016. In effect under the EPBC Act from 15-Jan-2016.

3.2.6 Summary of threat abatement/recovery plan

The threats to migratory shorebirds outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Habitat loss as a result of infrastructure and coastal development in Australia
- Modification of important habitat through chronic and acute pollution, invasive species and altered hydrological regimes
- Anthropogenic disturbance
- Climate variability and change
- Harvesting of shorebird prey
- Fisheries by-catch
- Hunting

Objectives and actions outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Protection of important habitat for migratory shorebirds that occurs throughout the East Asia-Australasian Flyway
- Protect and conserve wetland habitats on which migratory shorebirds are dependent upon
- Minimise or eliminate anthropogenic impacts to migratory shorebirds in Australia
- Identify and address knowledge gaps in migratory shorebird ecology to better inform decision makers, land managers and the public.

3.2.7 References

Atlas of Living Australia (2018). *Actitis hypoleucos*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:920b5569-aa29-4311-9f33-13bac4512b1d#overview [Accessed 23 August 2018].

Cramp, S. & Simmons, K.E.L. eds. (1983). *Handbook of the Birds of Europe, the Middle East and North Africa. The Birds of the Western Palearctic*. Volume 3, Waders to Gulls. Oxford: Oxford University Press.

Department of the Environment and Energy (2018). *Actitis hypoleucos* in Species Profile and Threats Database, Department of the Environment and Energy, Canberra. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies. [Accessed 24 August 2018].

Higgins, P.J. & Davies, S.J.J.F. eds (1996). *Handbook of Australian, New Zealand and Antarctic Birds. Volume Three - Snipe to Pigeons*. Melbourne, Victoria: Oxford University Press.

Kurek, D. (2017). Curlew Sandpipers. (Image) [Online] Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:920b5569-aa29-4311-9f33-13bac4512b1d#gallery [Accessed 20 September 2018].

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

3.3 Eastern osprey (*Pandion haliaetus*)

3.3.1 Status

EPBC Act – Marine and Migratory (Bonn)

3.3.2 Biology and ecology

3.3.2.1 Characteristic

The Eastern osprey (*Pandion haliaetus*) is a medium-sized raptor with a total length of 50 to 65 cm and wingspan 145 to 170 cm. It should be noted that two species of *Pandion* have recently been identified based on distribution. The Eastern osprey occurring in Australasia is now *P. cristatus* while the Western osprey occurring in Europe, Asia and the Americas is *P. haliaetus*. Typically, adults are mainly dark-brown to blackish-brown above and white below with a white head and neck, streaked blackish-brown, a dark-brown to blackish-brown crest, a black stripe across the eye and ear, a band of reddish-brown, brown or dark-brown streaking across the breast (sparse or absent in males), a white and pale greyish-brown underwing with black carpal patches and black trim, a white to pale greyish- brown undertail, yellow irides, a black bill and white to pale grey legs and feet (refer Photograph 3.3). The sexes are similar but females are typically larger than males (DotEE 2018; Marchant and Higgins 1993).

Photograph 3.3 **Eastern osprey (*Pandion haliaetus*)**

Source: DotEE (2018)

3.3.2.2 Known distribution

The total species range (breeding plus non-breeding) around the northern coast of Australia, extending from Esperance in Western Australia to NSW, is more widespread than southern areas where records become scarcer (i.e. Victoria and Tasmania), where the species is a rare vagrant (refer Figure 3.5). The distribution of the species around the northern coast appears continuous except for a possible gap at Eighty Mile Beach (DotEE 2018).

Figure 3.5 **Distribution range of the Eastern osprey**

Source: ALA (2020)

3.3.2.3 Distribution in relation to the project

Pandion haliaetus has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA, WildNet) indicate that this species exist from within 15 km of the disturbance footprint to the north where the Project intersects the Teviot Range, although no date exists for this sighting (refer Figure 3.6). Several records for this species exist to the south, south-west, north-west and north of the Project however most observations exist to the south-east, east and north-east closer to coastal areas. This species has not been detected during field investigations that have been carried out at the site.

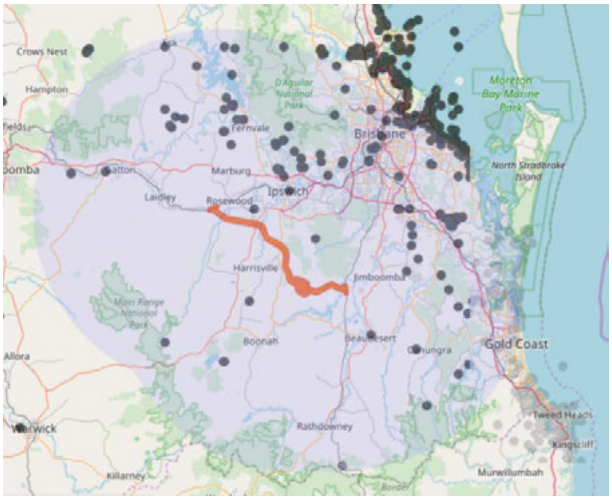

Figure 3.6 **Distribution range of the Eastern osprey in relation to the Project**

Source: ALA (2020)

3.3.2.4 Biology and reproduction

Eastern ospreys mainly feed on fish, especially mullet where available, and occasionally take molluscs, crustaceans, insects, reptiles, birds and mammals (DotEE 2018).

The Eastern osprey breeds from April to February in Australia and form monogamous pairs. Eastern osprey nests vary in size and shape, but they are generally large and are mostly composed of sticks. They are constructed in a variety of natural and artificial sites. Nest sites may be used over many years by one or more pairs. Females lay clutches of one to four eggs which are incubated by both sexes, but mainly by the female, for a period of 33 to 38 days. The nestlings are generally brooded by the female, but the male will take over when the female is absent from the nest. Pairs usually rear one brood but are capable of rearing two broods per season. Breeding attempts may be separated by periods of up to three years, as pairs do not typically breed each year (DotEE 2018; Hollands 2003; Marchant and Higgins 1993).

3.3.3 Habitat

Eastern ospreys occur in coastal habitats and terrestrial wetlands of tropical and temperate Australia. Typically, they are found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They frequent a variety of wetland habitats including inshore waters, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging sites (DotEE 2018; Marchant and Higgins 1993).

3.3.4 Threatening processes

The following have been identified as potentially threatening processes to the Eastern osprey:

- Loss, degradation or alteration of habitat for urban or tourism development (DotEE 2018)
- Other lesser threats include ingestion of pollutants such as pesticides, heavy metals or fishing tackle as well as competition for food with commercial and recreational fisheries (DotEE 2018).

3.3.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species. The following referral guideline has been identified for this species:

- Referral guideline for 14 birds listed as migratory species under the EPBC Act.

3.3.6 Summary of threat abatement/recovery plans

The actions considered to have a significant impact on migratory birds include:

- Substantial loss or modification of important habitat for the species
- Actions that cause serious disruptions to an ecologically significant proportion of a population impacting annual mortality rates or the breeding cycles of individuals
- Establishment of invasive species harmful to migratory species in areas of important habitat.

Objectives and actions outlined in the referral guideline include:

- Retain the necessary habitats and resources required for the listed migratory birds to successfully migrate and, where appropriate successfully breed throughout their natural range in Australia
- Provide parameters for assessing the significant impacts based on actions that are likely to seriously disrupt the lifecycle of an ecologically significant portion of any migratory species' population or an action that will result in invasive species harmful to migratory species becoming established in an area of important habitat
- Upper thresholds have been outlined for the impact related to the disruption of habitat or to an ecologically significant proportion of the population for each species listed in the referral guideline.

3.3.7 References

Atlas of Living Australia (2018). *Pandion cristatus*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:21464fca-984c-4103-ab72-5f6e9e7d5a2b [Accessed 24 August 2018].

Department of the Environment and Energy (2018). *Pandion cristatus* in Species Profile and Threats Database, Department of the Environment and Energy, Canberra. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82411 [Accessed 24 August 2018].

Hollands, D. (2003). *Eagles, Hawks and Falcons of Australia*. Second Edition. Melbourne: Bloomings Books.

Marchant, S. and Higgins P.J., eds. (1993). *Handbook of Australian, New Zealand and Antarctic Birds*. Volume 2 - Raptors to Lapwings. Melbourne, Victoria: Oxford University Press.

3.4 Glossy ibis (*Plegadis falcinellus*)

3.4.1 Status

EPBC Act – Marine and Migratory (Bonn)

3.4.2 Biology and ecology

3.4.2.1 Characteristic

The Glossy ibis (*Plegadis falcinellus*) is the smallest Australian ibis. On average, the Glossy ibis is 55 to 65 cm long, with a wingspan of 80 to 95 cm, and weight of approximately 500 to 800 g. The male is typically larger. It is characterised by a reddish-brown neck, a bronze-brown body and wings with a metallic, iridescent sheen. The Glossy ibis exhibits a distinctive long, downwards curved, bill. The facial skin is blue-grey that exhibits a white line, extending around the eyes (refer Photograph 3.4). Plumage in both sexes is similar, both intensifying to a rich chestnut on the neck, mantle, shoulders and under parts during the breeding period. A purple-green sheen appears on the head, upperparts, tail and wings during this time. During the non-breeding period, Juveniles are characterised by a similar dark plumage to adults (DotEE 2018; Marchant and Higgins 1990).

Photograph 3.4 Glossy ibis (*Plegadis falcinellus*)

Source: Karatay (2007)

3.4.2.2 Known distribution

Outside of its Australian distribution, the Glossy ibis is known from the eastern region of North America, Caribbean, Europe, Russia, Siberia, central Asia, sub-Saharan Africa, Pakistan, India, and Papua New Guinea. In Australia, it is found in all states and territories, but typically east of the Kimberley in Western Australia, and east of the Eyre Peninsula in South Australia (refer Figure 3.7). The Glossy ibis is known to have a patchy distribution in Western Australia and is considered a transient visitor to Tasmania (DotEE 2018; Marchant and Higgins 1990).

Figure 3.7 Distribution range of the Glossy ibis

Source: ALA (2020)

3.4.2.3 Distribution in relation to the project

Database records (i.e. AoLA and WildNet) indicated that *Plegadis falcinellus* has been identified as occurring within the ecology study area. A record from 2019 exists to the north of the Project where it intersects the Cunningham Highway (refer Figure 3.8). A number of records exist for this species in all directions around the Project except for the south-west where there are few occurrences. Glossy ibis was detected at the site during field investigations that were carried out by Aecom in 2010.

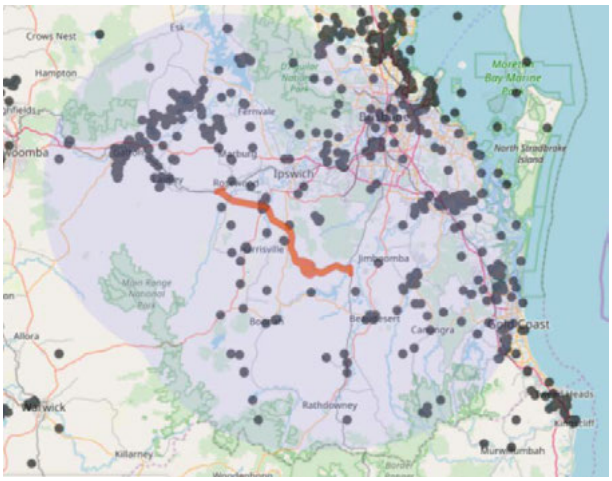

Figure 3.8 **Distribution range of the Glossy ibis in relation to the Project**

Source: ALA (2020)

3.4.2.4 Biology and reproduction

Glossy ibis typically feeds on a variety of aquatic invertebrates/insects. They may also eat fish, frogs, reptiles, and nestling birds (Marchant and Higgins 1990).

Glossy iIbis are known to live for approximately eight years and is matures by one or two years of age. Breeding season for Glossy ibis typically occurs mid-spring to the end of summer, though reproduction may extend from September to April, during favourable conditions (i.e. where there is plentiful food) at breeding sites. Breeding seasons have been recorded as coinciding with annual rain periods in some areas. The Glossy ibis builds a nest platform from twigs and aquatic vegetation. The nest is usually positioned less than one metre above water, in tall dense stands of vegetation. Three to six eggs are laid and both adults care for the young who fledge in approximately 25 to 28 days. Once fledged, adults remain feeding young for several weeks. The Glossy Ibis breeds at only a limited number of locations within Australia, including the Murray Darling Basin in northern NSW (NSW) and Channel Country of Queensland/South Australia (wetlands of the Bulloo, Diamantina and Georgina River systems, occasionally also Cooper Creek) (Birds Australia 2010; DotEE 2018; Marchant and Higgins 1990; Scott 1997).

3.4.3 Habitat

Glossy ibis typically prefer aquatic habitats including water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields, and cultivated land with irrigation. Occasionally, Glossy ibis occur in coastal habitats (e.g. estuaries, deltas, saltmarshes and lagoons), and has been recorded within mangroves during breeding periods. During periods of drought, this species may retreat to permanent wetlands and/or coastal areas. Glossy ibis typically roost in canopy or shrubs, typically nearby water bodies (Marchant and Higgins 1990).

3.4.4 Threatening processes

Human disturbance is a potential threat but there are currently no known serious threatening processes that have been identified for the Glossy ibis (DotEE 2018).

3.4.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species (DoEE 2018).

3.4.6 References

Atlas of Living Australia (2018). *Plegadis falcinellus*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:fd74a66c-2566-4a49-b46a-8a2a1699f594 [Accessed 29 August 2018].

Birds Australia (2010). *Birds in Backyards- Glossy Ibis factsheet*. Available from: http://birdsinbackyards.net/species/Plegadis-falcinellus [Accessed 29 August 2018].

Department of the Environment and Energy (2018). *Plegadis falcinellus* in Species Profile and Threats Database, Department of the Environment and Energy, Canberra. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=991 [Accessed 29 August 2018].

Karatay (2007). Photographic Image of *Plegadis falcinellus*. [Accessed 29 August 2018].

Marchant, S. and Higgins P.J. (1990). *Handbook of Australian, New Zealand and Antarctic Birds. Volume One - Ratites to Ducks*. Melbourne, Victoria: Oxford University Press.

Scott, A. (1997). *Relationships between waterbird ecology and river flows in the Murray-Darling Basin. CSIRO Technical report No. 5/97*. Available from: http://www.clw.csiro.au/publications/technical97/tr5-97.pdf. [Accessed 29 August 2018].

3.5 Latham's snipe (*Gallinago hardwickii*)

3.5.1 Status

EPBC Act – Marine and Migratory (Bonn, JAMBA, ROKAMBA)

3.5.2 Biology and ecology

3.5.2.1 Characteristic

Latham's snipe (*Gallinago hardwickii*) is a medium sized wader, and the largest snipe in Australia. This species typically measures 29 to 33 cm in length, and a 50 to 54 cm wingspan. It has a long straight bill, short broad pointed wings, a long tail, and short legs (DotEE 2018; Higgins and Davies 1996) (refer Photograph 3.5).

The Latham's snipe's plumage is intricately marked, with barring and chevrons of buff, black and various shades of brown. Blackish-brown stripes occur across the crown, and cream streaks occur down the back. The belly and parts of the head are white, and the tail is rufous, with a white tip. The sexes are similar in appearance, with no seasonal variation in the plumage. Non-breeding Latham's snipe have a plainer, less contrast colouring (Higgins and Davies 1996; Pizzey and Knight 1997).

Photograph 3.5 Latham's snipe (*Gallinago hardwickii*)

Source: Berzins (2012)

3.5.2.2 Known distribution

Latham's snipe breed in Japan, and far eastern Russia during the summer months of the northern hemisphere. They migrate south after the breeding season, travelling across Papua New Guinea to winter in eastern Australia. Latham's snipe has also been recorded as vagrants in New Zealand (DotEE 2018).

Latham's snipe is a non-breeding visitor to south-eastern Australia (refer Figure 3.9). It is a passage migrant through northern Australia ie it travels through northern Australia to reach non-breeding areas located further south). The species has been recorded along the east coast of Australia from Cape York Peninsula, through to south-eastern South Australia. Its range extends inland over the eastern tablelands in south-eastern Queensland, and to west of the Great Dividing Range in NSW (Barrett et al. 2003; Blakers et al. 1984; DotEE 2018; Higgins and Davies 1996).

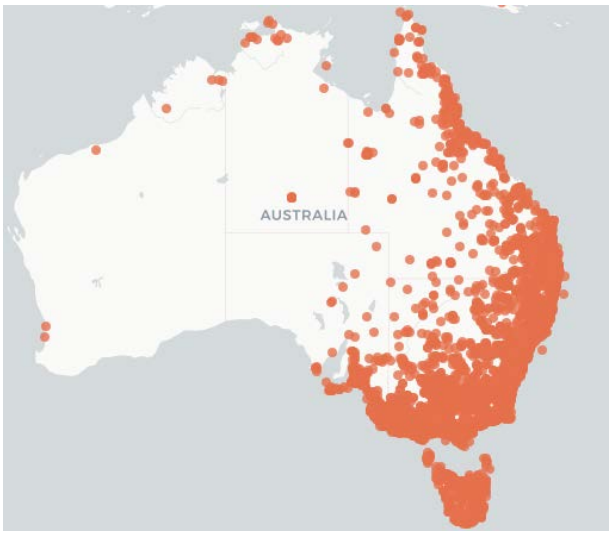

Figure 3.9 Distribution range of the Latham's Snipe

Source: ALA (2020)

3.5.2.3 Distribution in relation to the project

Gallinago hardwickii has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA) indicated that the species is known from within 10 km of the temporary and permanent disturbance footprint (refer Figure 3.10). A record from 2019 indicates the occurrence of this species within 10 km of the disturbance footprint to the north near the RAAF Rifle Range. Other records for this species occur mostly to the west, north-west, north, north-east, east and south-east of the Project. This species has not been detected during field investigations that have been carried out at the site.

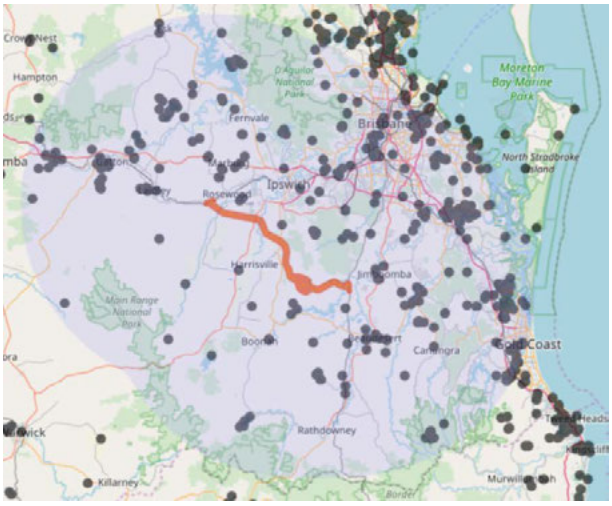

Figure 3.10 **Distribution range of the Latham's Snipe in relation to the Project**

Source: ALA (2020)

3.5.2.4 Biology and reproduction

Latham's snipe is an omnivorous species. It typically feeds on seeds and other plant material (mainly from *Cyperaceae, Poaceae, Juncaceae, Polygonaceae, Ranunculaceae* and *Fabaceae* families), and on invertebrates, including insects (mainly flies and beetles), earthworms and spiders, and occasionally molluscs, isopods and centipedes (DotEE 2018).

Latham's snipe does not breed in Australia; instead it breeds in Japan and eastern Russia (DotEE 2018).

3.5.3 Habitat

In Australia, Latham's snipe occurs in permanent and ephemeral wetlands up to 2,000 m above sea- level. They typically inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies. However, they are also known to occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (DotEE 2018).

The foraging habitats of Latham's snipe are typically characterised by areas of mud (either exposed or beneath a very shallow covering of water), and some form of cover (e.g. low, dense vegetation) (DotEE 2018).

The Latham's snipe roosts on the ground near (or sometimes in) their foraging areas, usually in sites that provide some degree of shelter (e.g. beside or under clumps of vegetation, among dense tea-tree, in forests, in drainage ditches or plough marks, among boulders, or in shallow water if cover is unavailable) (DotEE 2018).

Latham's snipe could potentially occur in Bluegrass (*Dichanthium*) dominant grasslands of the Brigalow Belt Bioregions (north and south), if this community is subject to flooding (DotEE 2018).

3.5.4 Threatening processes

The following have been identified as potentially threatening processes to the Latham's snipe:

- Loss of habitat caused by the drainage, modification of wetlands, agriculture and development of land (DotEE 2018)
- Easily disturbed by the intrusion of humans or cattle into their habitats (DotEE 2018)
- Pollution of wetlands.

3.5.5 Threat abatement/recovery plans

The following Threat abatement plan and Wildlife Conservation Plans have been identified as being relevant for this species:

- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). Threat abatement plan for predation by the European red fox. DEWHA, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-european-red-fox. In effect under the EPBC Act from 01-Oct-2008.
- Commonwealth of Australia (2015). Wildlife Conservation Plan for Migratory Shorebirds. Canberra, ACT: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/publications/wildlife-conservation-plan-migratory-shorebirds-2016. In effect under the EPBC Act from 15-Jan-2016.

3.5.6 Summary of threat abatement/recovery plan

Threats identified in the Threat abatement plan for predation by the European red fox include:

- Predation on native species causing a critical decline in many species across animal groups
- Competition for food with species they share dietary overlap and disease transmission
- Contributed to the extinction of many ground nesting bird species and the decline of small mammals.

Threat abatement actions for the European red fox include:

- Baiting
- Biological control
- Barriers
- Habitat management
- Shooting and bounties.

The threats to migratory shorebirds outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Habitat loss as a result of infrastructure and coastal development in Australia
- Modification of important habitat through chronic and acute pollution, invasive species and altered hydrological regimes
- Anthropogenic disturbance
- Climate variability and change
- Harvesting of shorebird prey
- Fisheries by-catch
- Hunting

Objectives and actions outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Protection of important habitat for migratory shorebirds that occurs throughout the East Asia-Australasian Flyway
- Protect and conserve wetland habitats on which migratory shorebirds are dependent upon
- Minimise or eliminate anthropogenic impacts to migratory shorebirds in Australia
- Identify and address knowledge gaps in migratory shorebird ecology to better inform decision makers, land managers and the public.

3.5.7 References

Atlas of Living Australia, (2018). *Gallinago hardwickii* – Latham's snipe, accessed 28 August 2018, available https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:6e718a65-6fec-44ec-a09a-ab2a0f2d464b.

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3.6 Oriental cuckoo (*Cuculus optatus*)

3.6.1 Status

EPBC Act – Migratory (CAMBA)

3.6.2 Biology and ecology

3.6.2.1 Characteristic

The Oriental cuckoo (*Cuculus optatus*) measures approximately 28 to 34 cm in length. The sexes are similar in appearance, the male being slightly larger than the female. The upper parts of the bird are grey, with a bronze gloss, and the tail is dark grey and black, spotted, and tipped white (refer Photograph 3.6). The flight feathers are grey, with pale bars. The chin, throat and upper breast is grey, and strongly barred with black (Schodde and Tidemann 2010).

Photograph 3.6 Oriental cuckoo (*Cuculus optatus*)

Source: Aviceda (2005)

3.6.2.2 Known distribution

Oriental cuckoos are non-breeding migrants from Asia, wintering across northern Australia from the Kimberley region in Western Australia, to Brisbane in Queensland, and occasionally south to Narooma, NSW (Schodde and Tidemann 2010) (refer Figure 3.11).

Figure 3.11 Distribution range of the Oriental cuckoo

Source: ALA (2020)

3.6.2.3 Distribution in relation to the project

Cuculus optatus has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA, WildNet) indicate that this species occurs within approximately 10 km of the disturbance footprint with an occurrence from 2007 to the north of the Project near Rosewood (refer Figure 3.12). There are scattered records for this species in all directions around the Project from within 50 km, most of which occur to the north-east. This species has not been detected during field investigations that have been carried out at the site.

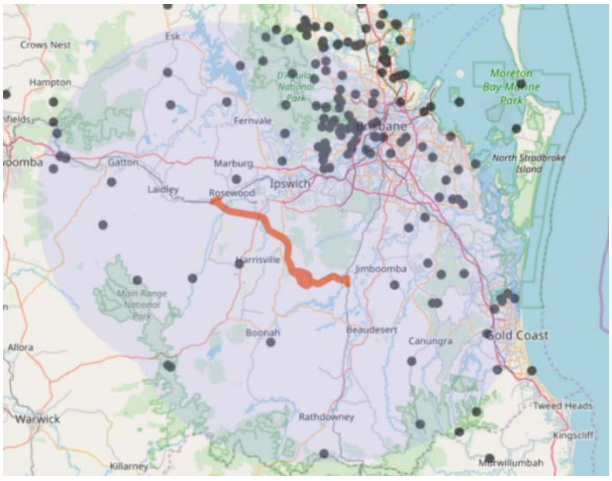

Figure 3.12 **Distribution range of the Oriental cuckoo in relation to the Project**

Source: ALA (2020)

3.6.2.4 Biology and reproduction

Oriental cuckoos feed predominately on caterpillars, stick insects, ants and beetles. They forage in trees, bushes, and the ground. Once the prey has been captured, this species typically flies to a tree branch to batter and consume its prey (Schodde and Tidemann 2010).

The Oriental cuckoo migrates from its breeding grounds in Eurasia each Autumn, to non-breeding winter grounds in southern Asia, Indonesia, New Guinea and Australia. It arrives along the northern Australian coast in November to -December, departing again in April (Schodde, and Tidemann, 2010).

3.6.3 Habitat

Oriental cuckoos inhabit monsoon forests, wet sclerophyll forests, paperbark swamps, dense open forests, scrubby gullies, and mangroves and is also known to use rainforest edges, leafy trees in paddocks, river flats and roadsides. This species prefers dense vegetation with a closed canopy (Pizzey and Knight 2007; Schodde and Tidemann 2010).

3.6.4 Threatening processes

There are currently no known serious threatening processes that have been identified for the Oriental cuckoo.

3.6.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species. The following referral guideline has been identified for this species:

- Referral guideline for 14 birds listed as migratory species under the EPBC Act.

3.6.6 Summary of threat abatement/recovery plans

The actions considered to have a significant impact on migratory birds include:

- Substantial loss or modification of important habitat for the species
- Actions that cause serious disruptions to an ecologically significant proportion of a population impacting annual mortality rates or the breeding cycles of individuals
- Establishment of invasive species harmful to migratory species in areas of important habitat.

Objectives and actions outlined in the referral guideline include:

- Retain the necessary habitats and resources required for the listed migratory birds to successfully migrate and, where appropriate successfully breed throughout their natural range in Australia
- Provide parameters for assessing the significant impacts based on actions that are likely to seriously disrupt the lifecycle of an ecologically significant portion of any migratory species' population or an action that will result in invasive species harmful to migratory species becoming established in an area of important habitat
- Upper thresholds have been outlined for the impact related to the disruption of habitat or to an ecologically significant proportion of the population for each species listed in the referral guideline.

3.6.7 References

Atlas of Living Australia (2018). *Cuculus optatus*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:b34cd2f6-79b3-4eee-9cf3-18a489d5d5fc [Accessed 24 August 2018].

Department of the Environment and Energy (2018). *Cuculus optatus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed: 23 August 2018

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Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

3.7 Pectoral sandpiper (*Calidris melanotos*)

3.7.1 Status

EPBC Act – Marine and Migratory (Bonn, JAMBA, ROKAMBA)

3.7.2 Biology and ecology

3.7.2.1 Characteristic

The Pectoral sandpiper (*Calidris melanotos*) has a length of approximately 19 to 23 cm and males tend to be larger. They are similar to Sharp-tailed sandpiper (*Calidris acuminata*) (refer Section 3.10) but plainer, browner and with a longer neck. It has a straight or slightly decurved bill that is only just longer than its head. The legs are dull olive-yellow, yellow or olive-grey, that are usually brighter than the Sharp-tailed sandpiper. The long feathers of the upperparts have pointed dark centres with pale brown margins. The underparts are whitish buff and sparesly streaked with dark brown or black streaking/mottling on the neck and breast (refer Photograph 3.7) (Pizzey and Knight 2007).

Photograph 3.7 **Pectoral sandpiper (*Calidris melanotos*)**

Source: Montgomery (n.d.)

3.7.2.2 Known distribution

The Pectoral sandpiper breeds in northern Russia and North America. During the non-breeding season, the species migrates south from August to May. In Australia, it is widespread but most common in eastern Queensland and south-eastern Australia (refer Figure 3.13) (Pizzey and Knight 2007).

Figure 3.13 **Distribution range of the Pectoral sandpiper**

Source: ALA (2020)

3.7.2.3 Distribution in relation to the project

Calidris melanotos has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA, WildNet) indicate the occurrence of this species from 1980 to the south of the Project where it intersects the Cunningham Highway from within approximately 5 km of the disturbance footprint (refer Figure 3.14). Other more recent records exist more recently although few occur within 50 km of the Project. These are mostly to the north-west, north and north-east of the Project. This species has not been detected during field investigations that have been carried out at the site.

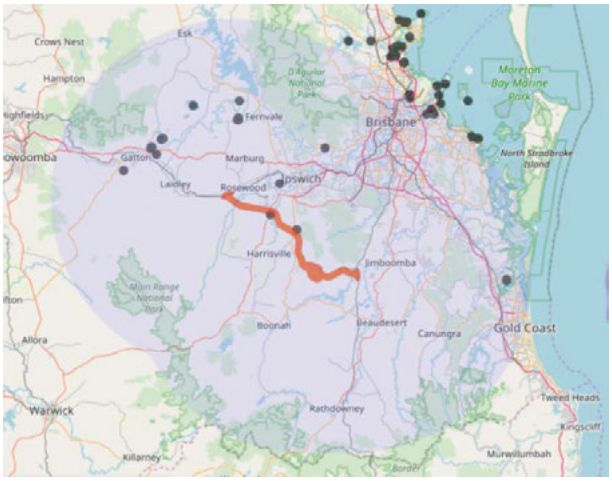

Figure 3.14 **Distribution range of the Pectoral sandpiper in relation to the Project**

Source: ALA (2020)

3.7.2.4 Biology and reproduction

In Australia, the Pectoral sandpiper is omnivorous, consuming algae, seeds, crustaceans, arachnids and insects (Higgins and Davies 1996).

This species does not breed in Australia and they migrate to north-eastern Siberia and North America to breed and nest (Higgins and Davies 1996).

3.7.3 Habitat

In Australia, the Pectoral sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. It is occasionally found further inland within wetlands and inundated vegetation (Higgins & Davies 1996).

3.7.4 Threatening processes

The following have been identified as potentially threatening processes to the Pectoral sandpiper:

- Habitat loss reducing the availability of foraging and roosting sites
- Habitat degradation including loss of marine or estuarine vegetation, invasion of intertidal mudflats by weeds, water pollution and changes to the hydrological regime and exposure of acid sulphate soils
- Disturbance from residential and recreational activities (DEWHA 2009).

3.7.5 Threat abatement/recovery plans

No abatement/recovery plan has been identified as being relevant for this species.

The following Wildlife Conservation Plan and marine bioregional plans have been identified as relevant for the species:

- Commonwealth of Australia (2015). *Wildlife Conservation Plan for Migratory Shorebirds*. Canberra, ACT: Department of the Environment. Available from: **http://www.environment.gov.au/biodiversity/publications/wildlife-conservation-plan-migratory-shorebirds-2016**. In effect under the EPBC Act from 15-Jan-2016.

3.7.6 Summary of threat abatement/recovery plans

The threats to migratory shorebirds outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Habitat loss as a result of infrastructure and coastal development in Australia
- Modification of important habitat through chronic and acute pollution, invasive species and altered hydrological regimes
- Anthropogenic disturbance
- Climate variability and change
- Harvesting of shorebird prey
- Fisheries by-catch
- Hunting.

Objectives and actions outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Protection of important habitat for migratory shorebirds that occurs throughout the East Asia-Australasian Flyway
- Protect and conserve wetland habitats on which migratory shorebirds are dependent upon
- Minimise or eliminate anthropogenic impacts to migratory shorebirds in Australia
- Identify and address knowledge gaps in migratory shorebird ecology to better inform decision makers, land managers and the public.

3.7.7 References

Atlas of Living Australia (2018). *Calidris melanotos*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:186ec2cd-8267-4162-8c0a-7c6bc51262c2 [Accessed 20 September 2018].

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3.8 Rufous fantail (*Rhipidura rufifrons*)

3.8.1 Status

EPBC Act – Marine and Migratory (Bonn)

3.8.2 Biology and ecology

3.8.2.1 Characteristic

Adult Rufous fantail (*Rhipidura rufifrons*) are medium sized birds, typically ranging in size from 14.5 to 18.5 cm in length, with a wingspan averaging of 21 cm. Both male and female specimens appear identical except for size, with males being slightly larger than females. The forehead is a rich reddish-brown colour across the eyes. The eyes have a white arc underneath. The top of the head, back of the neck and the upper back, transition from an olive to reddish-brown colour, which then blends into a blackish-brown, long, fan-shaped tail. This blackish-brown tail, contrasts with the base of the tail, which is tipped with a paler colour, often white (DotEE 2018; Higgins et al. 2006) (refer Photograph 3.8).

The Rufous fantail has black feathers over the ears and the throat is white. A black bar is present across the upper breast, below which the lower breast is off-white with black scale-like spots which transitions into an off-white colour towards the centre of the abdomen. The eyes, bill and feet of the bird are all a brown colour. The plumage in the immature birds is similar to that of adults. Adults moult annually prior to the breeding season, and this basic plumage does not vary (Higgins et al. 2006).

Photograph 3.8 Rufous fantail (*Rhipidura rufifrons*)

Source: Jones (2013)

3.8.2.2 Known distribution

The Rufous fantail occurs in coastal and near coastal districts of northern and eastern Australia. They also migrate north into much of SE Asia (Lindsey 1992) (refer Figure 3.15).

Figure 3.15 **Distribution range of the Rufous fantail**

Source: ALA (2020)

3.8.2.3 Distribution in relation to the project

Rhipidura rufifrons has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA, WildNet) indicate several sightings of this species from within the ecology study area at the Purga Nature Reserve (refer Figure 3.16). Many occurrence records for this species occur in all directions around the Project. This species was detected at the site during field investigations carried out by Aecom and GHD.

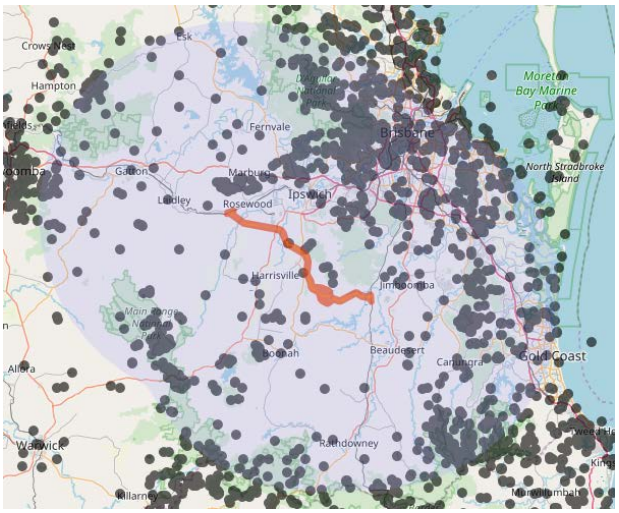

Figure 3.16 **Distribution range of the Rufous fantail in relation to the Project**

Source: ALA (2020)

3.8.2.4 Biology and reproduction

The Rufous fantail is an insectivorous species and typically gleaning and sallying in the low to middle strata of forests (Higgins et al., 2006).

The Rufous fantail is usually seen singly or in pairs, but occasionally in small groups. On winter passage, they have been observed in small flocks. The Rufous fantail generally breeds between September to February, with most individuals producing clutches between November to December. Clutch size approximates between two or three eggs, but as many as four have been recorded. Eggs are laid in a small cup-shaped nest which is usually constructed from grass, roots, fine strips of bark, plant-fibre, decayed wood, moss and spider web. The nest is placed in a tree, shrub or vine about 1.6 m above the ground (Higgins et al. 2006).

3.8.3 Habitat

In east and southeast Australia, the Rufous fantail typically inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as Tallowwood (*Eucalyptus microcorys*), Mountain grey gum (*E. cypellocarpa*), Narrow-leaved peppermint (*E. radiata*), Mountain ash (*E. regnans*), Alpine ash (*E. delegatensis*), Blackbutt (*E. pilularis*) or Red mahogany (*E. resinifera*). These areas usually have a dense shrubby understorey often including ferns. The species also occasionally occurs in secondary regrowth, following logging or disturbance in forests or rainforests. This species has also been recorded from parks and gardens during movement events (DotEE 2018).

3.8.4 Threatening processes

The following have been identified as potentially threatening processes to the Rufous fantail:

- Fragmentation
- Loss of core moist forest breeding habitat through land clearing and urbanisation; especially forest remnants and corridors along the species' migration routes.

3.8.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species. The following referral guideline has been identified for this species:

- Referral guideline for 14 birds listed as migratory species under the EPBC Act.

3.8.6 Summary of threat abatement/recovery plans

The actions considered to have a significant impact on migratory birds include:

- Substantial loss or modification of important habitat for the species
- Actions that cause serious disruptions to an ecologically significant proportion of a population impacting annual mortality rates or the breeding cycles of individuals
- Establishment of invasive species harmful to migratory species in areas of important habitat.

Objectives and actions outlined in the referral guideline include:

- Retain the necessary habitats and resources required for the listed migratory birds to successfully migrate and, where appropriate successfully breed throughout their natural range in Australia
- Provide parameters for assessing the significant impacts based on actions that are likely to seriously disrupt the lifecycle of an ecologically significant portion of any migratory species' population or an action that will result in invasive species harmful to migratory species becoming established in an area of important habitat
- Upper thresholds have been outlined for the impact related to the disruption of habitat or to an ecologically significant proportion of the population for each species listed in the referral guideline.

3.8.7 References

Atlas of Living Australia (2018). *Rhipidura rufifrons*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:025b08d1-0e50-4723-b581-9be91d8d09ed [Accessed 27 August 2018].

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Higgins, P.J. Peter J.M. and Cowling S.J. (2006). Handbook of Australian, New Zealand and Antarctic Birds. **In:** *Part A. Boatbill to Larks*. Volume 7. Melbourne, Victoria: Oxford University Press.

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Lindsey, T.R. (1992). Encyclopedia of Australian Animals: Birds. Page(s) 313. Collins-Angus and Robertson Publishers Pty Ltd.

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

3.9 Satin flycatcher (*Myiagra cyanoleuca*)

3.9.1 Status

EPBC Act – Marine and Migratory (Bonn)

3.9.2 Biology and ecology

3.9.2.1 Characteristic

The Satin flycatcher (*Myiagra cyanoleuca*) ranges in size from 15 to 17 cm. This species is blue-black and white bird with a small crest. The sexes are dimorphic. Males are glossy blue-black dorsally, with a blue-black chest and white below. Females are duskier blue-black dorsally, with an orange-red chin, throat and breast, and white underparts and pale-edged wing and tail feathers. Immature birds are dark brown-grey above, with pale streaks and buff edges to the wing feathers, and a mottled brown-orange throat and chest (DotEE 2018; Pizzey and Knight 2007) (refer Photograph 3.9).

Photograph 3.9 Satin flycatcher (*Myiagra cyanoleuca*)

Source: Birds Australia (2010)

3.9.2.2 Known distribution

The Satin flycatcher occurs along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia (refer Figure 3.17). In Queensland, it is widespread but scattered in the east. The Satin flycatcher is a migratory species, moving northwards in winter to northern Queensland and Papua New Guinea, returning south to breed in spring (BirdLife Australia 2012; Pizzey and Knight 2007).

Figure 3.17 **Distribution range of the Satin flycatcher**

Source: ALA (2020)

3.9.2.3 Distribution in relation to the project

Myiagra cyanoleuca has been identified as potentially occurring within the ecology study area. Database records (i.e. AoLA, WildNet) indicate that this species exists within approximately 20 km of the disturbance footprint from Marburg in 1981 (refer Figure 3.18). Other more recent records exist for this species from with 50 km of the disturbance footprint in all directions. This species has not been detected during field investigations that have been carried out at the site.

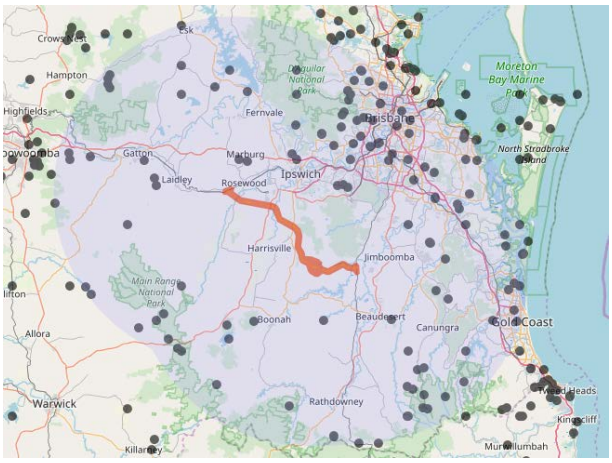


Figure 3.18 **Distribution range of the Satin flycatcher in relation to the Project**

Source: ALA (2020)

3.9.2.4 Biology and reproduction

Satin flycatchers are mainly insectivorous although very occasionally they will also eat seeds.

The Satin flycatcher builds a neat cup of bark strips, moss and spiders webs on a horizontal dead branch located 5 to 25 m above the ground under living foliage. This species has been reported to nest in loose groups with each individual pair spaced between 20 to 50 m apart. Both sexes build the nest, incubate the eggs and feed the young. Clutch size ranges from two to three eggs and breeding occurs between October and February (Pizzey and Knight 2007).

3.9.3 Habitat

The Satin flycatcher is found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests. This species is known to inhabit heavily vegetated gullies in Eucalypt dominated forests and taller woodlands usually above the shrub layer. On migration, this species occurs in coastal forests, woodlands, mangroves and drier woodlands and open forests as well as trees in open country and gardens (BirdLife Australia 2012; Blakers et al. 1984; Pizzey and Knight 2007).

3.9.4 Threatening processes

The following have been identified as potentially threatening processes to the Satin flycatcher (Blakers et al. 1984):

- Clearing and logging of forests, particularly mature forests, in south-eastern Australia (Blakers et al. 1984).

3.9.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species. The following referral guideline has been identified for this species:

- Referral guideline for 14 birds listed as migratory species under the EPBC Act.

3.9.6 Summary of threat abatement/recovery plans

The actions considered to have a significant impact on migratory birds include:

- Substantial loss or modification of important habitat for the species
- Actions that cause serious disruptions to an ecologically significant proportion of a population impacting annual mortality rates or the breeding cycles of individuals
- Establishment of invasive species harmful to migratory species in areas of important habitat.

Objectives and actions outlined in the referral guideline include:

- Retain the necessary habitats and resources required for the listed migratory birds to successfully migrate and, where appropriate successfully breed throughout their natural range in Australia
- Provide parameters for assessing the significant impacts based on actions that are likely to seriously disrupt the lifecycle of an ecologically significant portion of any migratory species' population or an action that will result in invasive species harmful to migratory species becoming established in an area of important habitat
- Upper thresholds have been outlined for the impact related to the disruption of habitat or to an ecologically significant proportion of the population for each species listed in the referral guideline.

3.9.7 References

Atlas of Living Australia (2018). *Myiagra cyanoleuca*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:77929aae-e7de-48dd-aac9-ba1080d28783 [Accessed 27 August 2018].

BirdLife Australia (2012). BirdLife Australia Database, Available: http://BirdLife.org.au/ [Accessed 27 August 2018].

Birds Australia (2010). *Birds in Backyards- Satin flycatcher factsheet*. [Online]. Available from: http://www.birdsinbackyards.net/species/Myiagra-cyanoleuca

Blakers, M., Davies S.J.J.F. and Reilly P.N. (1984). *The Atlas of Australian Birds*. Melbourne, Victoria: Melbourne University Press.

Department of the Environment and Energy (2018). *Myiagra cyanoleuca* in Species Profile and Threats Database, Department of the Environment and Energy, Canberra. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=82411 [Accessed 27 August 2018].

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

3.10 Sharp-tailed sandpiper (*Calidris acuminata*)

3.10.1 Status

EPBC Act – Marine and Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)

3.10.2 Biology and ecology

3.10.2.1 Characteristic

The Sharp-tailed sandpiper (*Calidris acuminata*) grow to 17 to 21 cm long, with males being usually larger. It has a small straight or slightly decurved bill that is longer than its head. The legs are dull olive-yellow, yellow or olive-grey. It has a dull chestnut crown with dark eyelines that becomes browner on ear-coverts. The long feathers of the upperparts have pointed dark centres with pale brown margins. The underparts are whitish buff and sparesly streaked (refer Photograph 3.10). During the breeding season the upperparts are rufous with buff-white edges and they have an upperbreast which is buffish and heavily streaked on the flanks (Pizzey and Knight 2007).

Photograph 3.10 Sharp-tailed sandpiper (*Calidris acuminata*)

Source: Leo (2017)

3.10.2.2 Known distribution

The Common sandpiper breeds in northern Siberia, from the delta of the Lena River, east to Chaun Gulf and east of the Kolyma River delta. It visits Australia from August to May and commonly found in the south-east but widespread across Australia in both inland and coastal locations (refer Figure 3.19) (Higgins & Davies 1996).

Figure 3.19 **Distribution range of the Sharp-tailed sandpiper**

Source: ALA (2020)

3.10.2.3 Distribution in relation to the project

Calidris acuminata has been identified as potentially occurring within the ecology study area. Database records from 2015 (i.e. AoLA, WildNet) indicate that this species exists from within 2 km of the disturbance footprint where the Project intersects the Teviot Range (refer Figure 3.20). Other records for the species exist from within 50 km of the disturbance footprint with most occurring to the north-west, north-east and west of the Project. This species has not been detected during field investigations that have been carried out at the site.

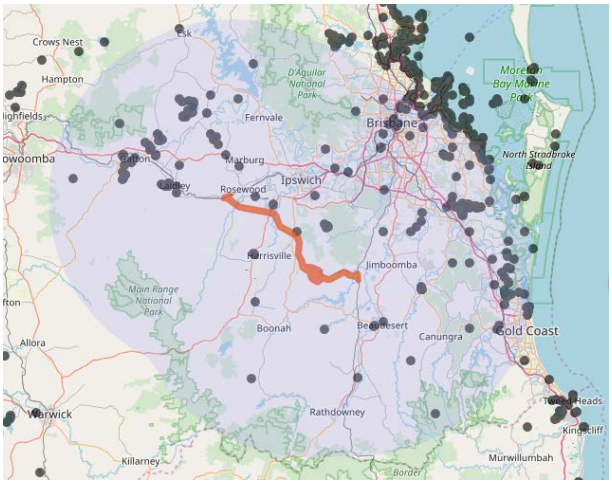


Figure 3.20 **Distribution range of the Sharp-tailed sandpiper in relation to the Project**

Source: ALA (2020)

3.10.2.4 Biology and reproduction

In Australia, the Sharp-tailed sandpiper forages on seeds, worms, molluscs, crustaceans and insects (Higgins & Davies 1996).

This species does not breed in Australia and they migrate to northern Siberia to breed and nest (Higgins & Davies 1996).

3.10.3 Habitat

In Australia, the Sharp-tailed sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation including lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets and estuaries or seashores (Higgins & Davies 1996).

3.10.4 Threatening processes

The following have been identified as potentially threatening processes to the Sharp-tailed sandpiper:

- Habitat loss reducing the availability of foraging and roosting sites
- Habitat degradation including loss of marine or estuarine vegetation, invasion of intertidal mudflats by weeds, water pollution and changes to the hydrological regime and exposure of acid sulphate soils (DEWHA 2009).

3.10.5 Threat abatement/recovery plans

No recovery plan has been identified as being relevant for this species.

The following Wildlife Conservation Plan and marine bioregional plan has been identified as relevant for the species:

- Commonwealth of Australia (2015). *Wildlife Conservation Plan for Migratory Shorebirds*. Canberra, ACT: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/publications/wildlife-conservation-plan-migratory-shorebirds-2016. In effect under the EPBC Act from 15-Jan-2016.

3.10.6 Summary of threat abatement/recovery plans

The threats to migratory shorebirds outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Habitat loss as a result of infrastructure and coastal development in Australia
- Modification of important habitat through chronic and acute pollution, invasive species and altered hydrological regimes
- Anthropogenic disturbance
- Climate variability and change
- Harvesting of shorebird prey
- Fisheries by-catch
- Hunting

Objectives and actions outlined in the Wildlife Conservation Plan for Migratory Shorebirds include:

- Protection of important habitat for migratory shorebirds that occurs throughout the East Asia-Australasian Flyway
- Protect and conserve wetland habitats on which migratory shorebirds are dependent upon
- Minimise or eliminate anthropogenic impacts to migratory shorebirds in Australia
- Identify and address knowledge gaps in migratory shorebird ecology to better inform decision makers, land managers and the public.

3.10.7 References

Atlas of Living Australia (2018). *Calidris acuminata*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:75106fa7-7d65-4724-814d-dce6306c79d9 [Accessed 20 September 2018].

Department of the Environment and Energy (2018). *Calidris acuminata* in Species Profile and Threats Database, Department of the Environment and Energy, Canberra. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=874 [Accessed 27 August 2018].

Department of the Environment, Water, Heritage and the Arts (2009). Draft Significant impact guidelines for 36 migratory shorebirds Draft EPBC Act Policy Statement 3.21. Canberra, ACT: Commonwealth of Australia. Available from: http://www.environment.gov.au/epbc/publications/migratory-shorebirds.html.

Higgins, P.J. and Davies S.J.J.F. eds (1996). *Handbook of Australian, New Zealand and Antarctic Birds. Volume Three - Snipe to Pigeons*. Melbourne, Victoria: Oxford University Press.

Leo (2017). *Calidris acuminata*. (Image) [Online] Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:75106fa7-7d65-4724-814d-dce6306c79d9 [Accessed 20 September 2018].

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

3.11 Spectacled monarch (*Symposiachrus trivirgatus*)

3.11.1 Status

EPBC Act – Migratory (Bonn)

3.11.2 Biology and ecology

3.11.2.1 Characteristic

The Spectacled monarch (*Symposiachrus trivirgatus*) approximates 15 cm in size and is blue-grey above, with a black face mask that extends across both eyes. The breast is rufous in colour and the underparts are pale. The tail is black with white outer tips. Immature birds lack the black face and have a grey throat (Pizzey and Knight 2007) (refer Photograph 3.11).

Photograph 3.11 Spectacled monarch (*Symposiarchrus trivirgatus*)

Source: Hansch (2009)

3.11.2.2 Known distribution

The Spectacled monarch is found in coastal north-eastern and eastern Australia, including coastal islands, from Cape York, Queensland to Port Stephens, NSW (refer Figure 3.21). It is much less common in the south. It is also found in Papua New Guinea, the Moluccas and Timor (Blakers et al. 1984; DotEE 2018).

Figure 3.21 Distribution range of the Spectacled monarch

Source: ALA (2020)

3.11.2.3 Distribution in relation to the project

Symposiachrus trivirgatus has been identified as potentially occurring within the ecology study area. Database records from 2006 (i.e. AoLA, WildNet) indicated that the species is known from within 5 km of the disturbance footprint (refer Figure 3.22). Other records for this species exist from with 50 km of the disturbance footprint with most occurring to the south-east, east, north-east and north of the Project. This species has not been detected during field investigations that have been carried out at the site.

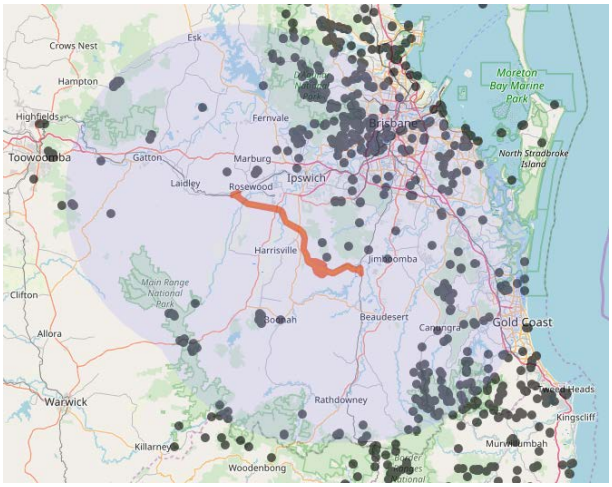


Figure 3.22 Distribution range of the Spectacled monarch in relation to the Project

Source: ALA (2020)

3.11.2.4 Biology and reproduction

The Spectacled monarch forages for insects among foliage, or catches flying insects on the wing (Pizzey and Knight 2007).

The Spectacled monarch is a resident in the north of its range (i.e. from Rockhampton in QLD Queensland northward) but is a summer breeding migrant to coastal south-eastern Australia, arriving in September and returning northwards in March. It may also migrate to Papua New Guinea in autumn and winter. The Spectacled monarch builds a small cup nest of fine bark, plant fibres, moss and spider web generally in a tree fork or in hanging vine 1 to 6 m above the ground. Nests are often located near water. Only the female builds the nest, but both sexes incubate the eggs and feed the young. Clutch size consists of two eggs. Reproduction occurs between October and February (DotEE 2018; Pizzey and Knight 2007).

3.11.3 Habitat

The Spectacled monarch inhabits both dense low vegetation and habitats with fairly open understoreys. The species prefers the understorey of mountain and lowland rainforests, thickly wooded gullies and waterside vegetation (Pizzey and Knight 2007).

3.11.4 Threatening processes

There are currently no known serious threatening processes that have been identified for the Spectacled monarch.

3.11.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species. The following referral guideline has been identified for this species:

- Referral guideline for 14 birds listed as migratory species under the EPBC Act.

3.11.6 Summary of threat abatement/recovery plans

The actions considered to have a significant impact on migratory birds include:

- Substantial loss or modification of important habitat for the species
- Actions that cause serious disruptions to an ecologically significant proportion of a population impacting annual mortality rates or the breeding cycles of individuals
- Establishment of invasive species harmful to migratory species in areas of important habitat.

Objectives and actions outlined in the referral guideline include:

- Retain the necessary habitats and resources required for the listed migratory birds to successfully migrate and, where appropriate successfully breed throughout their natural range in Australia
- Provide parameters for assessing the significant impacts based on actions that are likely to seriously disrupt the lifecycle of an ecologically significant portion of any migratory species' population or an action that will result in invasive species harmful to migratory species becoming established in an area of important habitat
- Upper thresholds have been outlined for the impact related to the disruption of habitat or to an ecologically significant proportion of the population for each species listed in the referral guideline.

3.11.7 References

Atlas of Living Australia (2018). *Symposiachrus trivirgatus*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:025b08d1-0e50-4723-b581-9be91d8d09ed [Accessed 27 August 2018].

Blakers, M., Davies S.J.J.F. and Reilly P.N. (1984). *The Atlas of Australian Birds*. Melbourne, Victoria: Melbourne University Press.

Department of the Environment and Energy (2018). *Symposiachrus trivirgatus* in Species Profile and Threats Database, Department of the Environment and Energy, Canberra. Available from: https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=592 [Accessed 27 August 2018].

Hansch, L (2009). *Spectacled monarch* (Image) [Online] Available at http://ibc.lynxeds.com/photo/spectacled-monarch-monarcha-trivirgatus/perched [Accessed 27 August 2018].

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

3.12 Yellow wagtail (*Motacilla flava*)

3.12.1 Status

EPBC Act – Marine and Migratory (CAMBA, JAMBA, ROKAMBA)

3.12.2 Biology and ecology

3.12.2.1 Characteristic

The Yellow wagtail (*Motacilla flava*) is approximately 16.4 to 18 cm long with dark legs and uniform grey-green rump. In the nonbreeding season adults have greyish brown upperparts with white or yellowish eyebrows, dark ear-coverts and a buff-white breast. They have dark wings with white or yellow margins in a netted pattern on the upper wings (refer Photograph 3.12). In breeding plumage, they have bright yellow underparts from breast to vent. Juvenile forms are browner than the nonbreeding form with bolder spotted necklaces or yellow patches. They also make a high pitched ‘sweet’ or ‘tzeep’ sound (Pizzey and Knight 2007).

Photograph 3.12 Yellow wagtail (*Motacilla flava*)

Source: OZ Animals (n.d.)

3.12.2.2 Known distribution

They breed from Europe to Siberia and migrate south to Africa, SE Asia and Australia. In Australia, they are found in mostly coastal northern areas but also further south in NSW and southern WA Western Australia from November to April (Pizzey and Knight 2007) (refer Figure 3.23).

Figure 3.23 **Distribution range of the Yellow wagtail**

Source: ALA (2020)

3.12.2.3 Distribution in relation to the project

Motacilla flava has been predicted to occur within the region and associated habitat within the ecology study area. Database records from 2014 (i.e. AoLA, WildNet) indicate that the nearest specimen backed record exists more than 50 km from the disturbance footprint (refer Figure 3.24). Several other records exist for Southeast Queensland along the coast between Caboolture and Brisbane with a few other records around Lismore in Northern New South Wales. This species has not been detected during field investigations that have been carried out at the site.

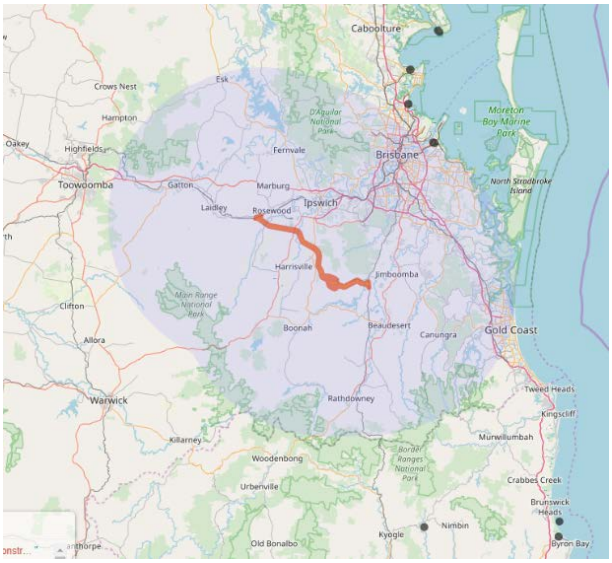


Figure 3.24 **Distribution range of the Yellow wagtail in relation to the Project**

Source: ALA (2020)

3.12.2.4 Biology and reproduction

It feeds on a wide variety of terrestrial and aquatic invertebrates as well as some plant material, particularly seeds (BirdLife International (2017).

Yellow wagtails do not breed in Australia and migrate north from April to August (Pizzey and Knight 2007).

3.12.3 Habitat

Yellow wagtails can be found in and around short grass, bare ground, swamp margins, sewage ponds, saltmarshes, sports fields, airfields, ploughed land and urban lawns (Pizzey and Knight 2007).

3.12.4 Threatening processes

The following have been identified as potentially threatening processes to the Yellow wagtail (BirdLife International (2017):

- Agricultural intensification
- Wetland drainage
- Use of pesticides (BirdLife International 2017).

3.12.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species. The following referral guideline has been identified for this species:

- Referral guideline for 14 birds listed as migratory species under the EPBC Act.

3.12.6 Summary of threat abatement/recovery plans

The actions considered to have a significant impact on migratory birds include:

- Substantial loss or modification of important habitat for the species
- Actions that cause serious disruptions to an ecologically significant proportion of a population impacting annual mortality rates or the breeding cycles of individuals
- Establishment of invasive species harmful to migratory species in areas of important habitat.

Objectives and actions outlined in the referral guideline include:

- Retain the necessary habitats and resources required for the listed migratory birds to successfully migrate and, where appropriate successfully breed throughout their natural range in Australia
- Provide parameters for assessing the significant impacts based on actions that are likely to seriously disrupt the lifecycle of an ecologically significant portion of any migratory species' population or an action that will result in invasive species harmful to migratory species becoming established in an area of important habitat
- Upper thresholds have been outlined for the impact related to the disruption of habitat or to an ecologically significant proportion of the population for each species listed in the referral guideline
- The Yellow wagtail is one of the five non-breeding species outlined in the referral guideline. As they are considered to be extremely uncommon migrants the number of individuals at any one site are so small relative to their global population that no small group of individuals is likely to be significant for the species in Australia or the ecological attributes for a site. For these species it is sufficient to lodge records with the Commonwealth to satisfy the recommendation.

3.12.7 References

Atlas of Living Australia (2018). *Motacilla flava*. Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:5b193d88-79d6-4a38-9c11-1385bace84c8#overview [Accessed 29 August 2018].

BirdLife International (2017). *Motacilla flava* (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2017: e.T103822349A119286241. Available from: http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T103822349A119286241.en. [Accessed 29 August 2018]

OZ Animals (n.d.). *Motacilla flava* (Image) [Online] Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:5b193d88-79d6-4a38-9c11-1385bace84c8#gallery [Accessed 29 August 2018].

Pizzey, G. and Knight, F. (2007). *The Field Guide to the Birds of Australia*. Harper Collins publishing, Sydney.

4 Fauna – Special least concern – mammals

4.1 Short-beaked echidna (*Tachyglossus aculeatus*)

4.1.1 Status

EPBC Act – Not listed

NC Act – Special least concern

4.1.2 Biology and ecology

4.1.2.1 Characteristic

The Short-beaked echidna (*Tachyglossus aculeatus*) is recognised by the extensive coverage of spines. It has a length of up to 450 mm and weighs up to 7 kg (females will usually weigh less). It also has hair present between the spines and they range in colour from light brown in the northern, hotter parts of Australia to darker in the south. The snout is 7 to 8 cm long and is rigid (refer Photograph 4.1). It has short, stout limbs and on the front feet they have five flattened claws which for digging. The back feet point backwards and help to push the soil away when the animal is burrowing (NPWS 1999; Queensland Museum 1995).

Photograph 4.1 Short-beaked echidna (*Tachyglossus aculeatus*)

Source: Edmonds (2015)

4.1.2.2 Known distribution

The Short-beaked echidna is found across all states and territories but appears to be most abundant in central and eastern Australia (ALA 2018) (refer Figure 4.1).

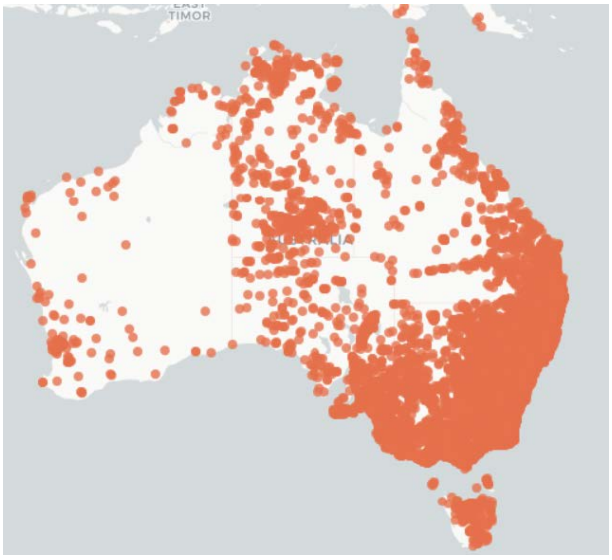


Figure 4.1 **Distribution range of the Short-beaked echidna**

Source: ALA (2020)

4.1.2.3 Distribution in relation to the project

Tachyglossus aculeatus has been identified as having the potential to occur within the disturbance footprint. Database records from 1999 (i.e. AoLA and WildNet) indicate that this species has been recorded from within the ecology study area near the Purga Nature Reserve (refer Figure 4.2). Other records indicate that this species occurs in all directions around the Project. Field investigations carried out by GHD in 2016 detected echidna diggings and scratching indicating presence of the species at the site.

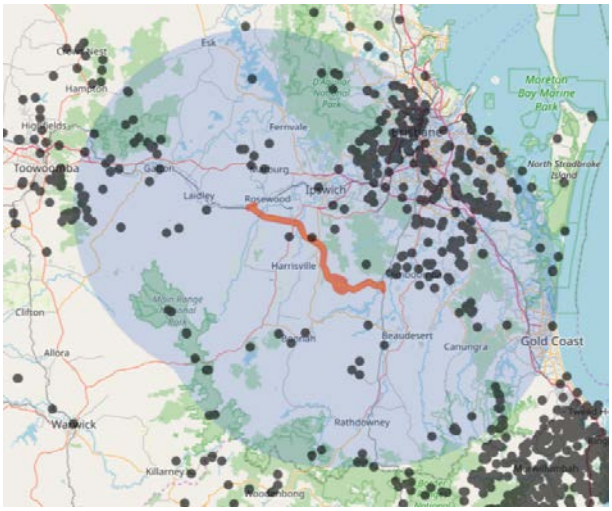


Figure 4.2 **Distribution range of the Short-beaked echidna in relation to the Project**

Source: ALA (2020)

4.1.2.4 Biology and reproduction

Termites and ants are its preferred food however it also eats earthworms, beetles and moth larvae.

Short-beaked echidnas breed from the end of June to early September. A particular characteristic displayed by echidnas during the breeding season is the formation of ‘trains’. A female lays a single egg, which is incubated in the pouch and takes about ten days to hatch. The young echidna is suckled by its mother from mammary glands in the pouch, and is carried in the pouch for about three months. During this time the female will sometimes leave the young animal in a burrow, made by the female for its protection. The young echidna will leave the burrow at around 12 months of age. They have been known to live 10 to 16 years in the wild (Rismiller 1993; Rismiller and Seymour 1991; Strahan 1995).

4.1.3 Habitat

The distribution of the Short-beaked echidna ranges from undisturbed to disturbed habitats, and includes forests, woodlands, shrublands and grasslands, rocky outcrops and agricultural lands. Echidnas are usually found among rocks, in hollow logs, under vegetation or piles of debris, under tree roots or sometimes in wombat or rabbit burrows (Hyett and Shaw 1980).

4.1.4 Threatening processes

The following have been identified as potentially threatening processes to the Short-beaked echidna:

- Habitat loss – urban development
- Roadkill on roads
- Invasive predators, mostly domestic dogs (NPWS 1999).

4.1.5 Threat abatement/recovery plans

No threat abatement/recovery plan has been identified as being relevant for this species (DoEE 2018).

4.1.6 References

Atlas of Living Australia (2018) *Tachyglossus aculeatus.* Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:0d4c9c0c-51d3-44e0-a365-fe0f8b791c66#overview [Accessed 21 August 2018].

Edmonds A. (2015). *Tachyglossus aculeatus.* (Image) [Online] Available from: https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:0d4c9c0c-51d3-44e0-a365-fe0f8b791c66#gallery [Accessed 30 August 2018].

Hyett, J. and Shaw, N. (1980). *Australian Mammals: A Field Guide for NSW, Victoria, South Australia and Tasmania*, Thomas Nelson Australia, Melbourne.

National Parks and Wildlife Service (1999). Echidnas, Helping Them in the Wild. Hurstville, New South Wales: National Parks and Wildlife Service.

Queensland Museum (1995). *Wildlife of Greater Brisbane*. Brisbane: Queensland Museum Publications.

Rismiller, P. D. (1993). 'Overcoming a prickly problem', *Australian Natural History Magazine*, vol. 24, no. 6, pp. 22–29.

Rismiller, P.D. and Seymour, R.S. (1991). 'The echidna', *Scientific American*, vol. 264, no. 2, February, pp. 96– 103.

Strahan, R. (ed.) (1995). *The Mammals of Australia*, Reed Books, Sydney.

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix C Herbarium confirmation letters

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Queensland
Government

Department of
Environment and Science

Queensland Herbarium
Brisbane Botanic Gardens Mt Coot-tha•Toowong 4066 Queensland•Australia
Telephone +61 7 3896 9326 • Facsimile +61 7 3896 9624
e-mail Queensland.Herbarium@qld.gov.au
http://www.qld.gov.au/herbarium

Enquiries Tony Bean
Telephone 07 3896 9318
Your reference
Our reference ARB:mh 567/18

19 July 2018

Chris Schell
Aurecon Australia
Locked Bag 331
BRISBANE Qld 4001

Dear Chris

The botanical specimens received by the Queensland Herbarium on 10 July 2018 have been identified as:

#Melaleuca irbyana, confirmed. This species is listed as Endangered under Queensland's *Nature Conservation Act 1992*.
#Notelaea lloydii. This species is listed as Vulnerable under Queensland's *Nature Conservation Act 1992*.

These specimens have been kept for incorporation into the Herbarium collection, with thanks.

There is a charge of $114.40 (minimum charge 1hr) for these identifications.

Yours sincerely

G.P.Guymer
Director

Download a full version of Census of the Queensland Flora 2017
https://data.qld.gov.au/dataset/census-of-the-queensland-flora-2017

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix D Database Search Results

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

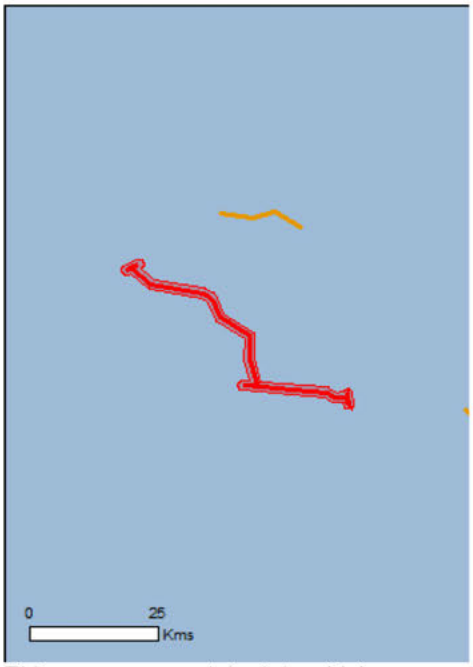
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 06/02/20 12:26:38

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



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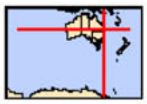

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	47
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	34
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Moreton bay	30 - 40km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Swamp Tea-tree (Melaleuca irbyana) Forest of South-east Queensland	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma_coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta_scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Maccullochella mariensis Mary River Cod [83806]	Endangered	Translocated population known to occur within area
Neoceratodus forsteri Australian Lungfish, Queensland Lungfish [67620]	Vulnerable	Species or species habitat known to occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or

Name	Status	Type of Presence
		related behaviour known to occur within area
Plants		
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Bertya ernestiana a shrub [78349]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area
Cupaniopsis tomentella Boonah Tuckeroo [3322]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area
Lepidium peregrinum Wandering Pepper-cress [14035]	Endangered	Species or species habitat may occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
Notelaea ipsviciensis Cooneana Olive [81858]	Critically Endangered	Species or species habitat may occur within area
Notelaea lloydii Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Phebalium distans Mt Berryman Phebalium [81869]	Critically Endangered	Species or species habitat may occur within area
Planchonella eerwah Shiny-leaved Condoo, Black Plum, Wild Apple [17340]	Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Saiphos reticulatus Three-toed Snake-tooth Skink [88328]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Gum Tips	QLD

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		

Name	Status	Type of Presence
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-27.66388 152.53775,-27.65499 152.55935,-27.66085 152.54634,-27.68574 152.58139,-27.69984 152.67169,-27.70561 152.68423,-27.71032 152.68766,-27.73737 152.70122,-27.76608 152.75306,-27.80238 152.75203,-27.84216 152.76576,-27.84221 152.74164,-27.85263 152.88747,-27.86143 152.90258,-27.86006 152.9206,-27.85566 152.92369,-27.87076 152.92539,-27.86538 152.92198

Acknowledgements

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.

Table of Contents

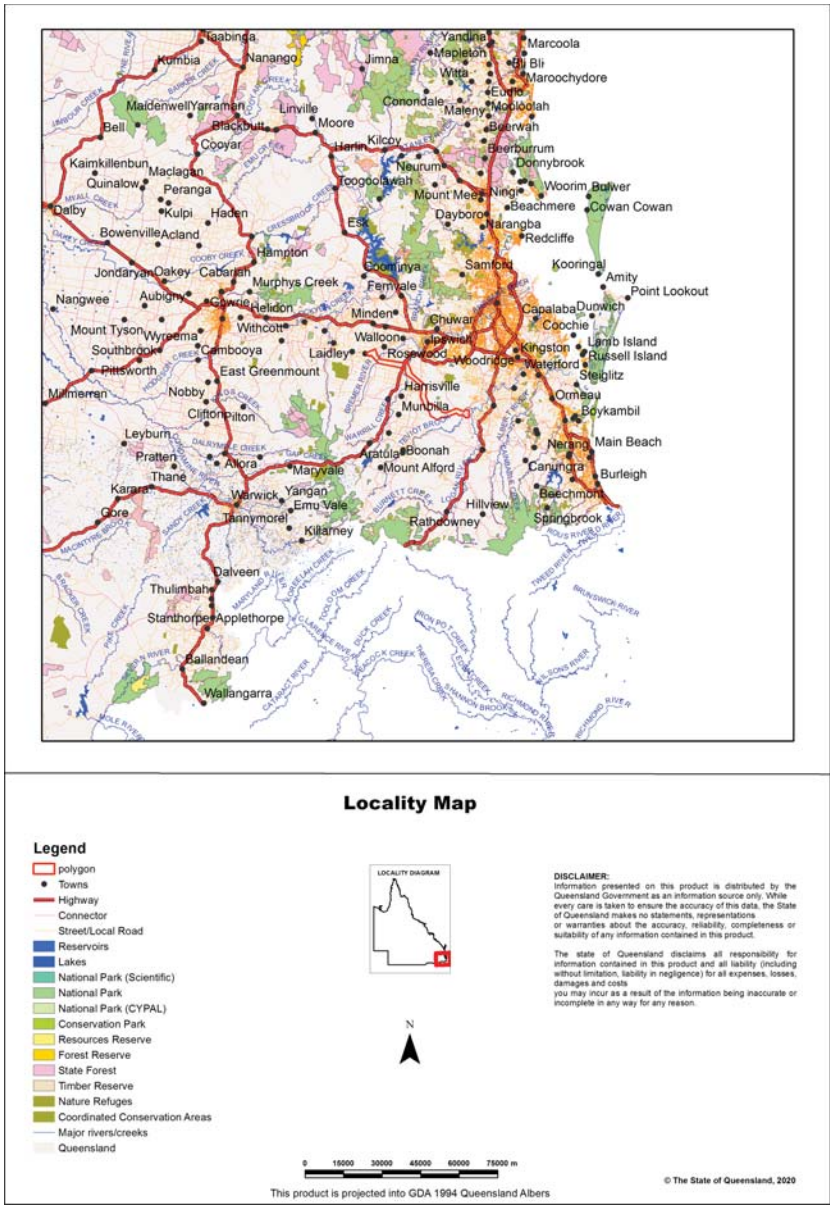
Assessment Area Details . . . 4
Matters of State Environmental Significance (MSES) . . . 5
MSES Categories . . . 5
MSES Values Present . . . 6
Additional Information with Respect to MSES Values Present . . . 7
MSES - State Conservation Areas . . . 7
MSES - Wetlands and Waterways . . . 7
MSES - Species . . . 7
MSES - Regulated Vegetation . . . 8
Map 1 - MSES - State Conservation Areas . . . 11
Map 2 - MSES - Wetlands and Waterways . . . 12
Map 3 - MSES - Species . . . 13
Map 4 - MSES - Regulated Vegetation . . . 14
Map 5 - MSES - Offset Areas . . . 15
Appendices . . . 16
Appendix 1 - Matters of State Environmental Significance (MSES) methodology . . . 16
Appendix 2 - Source Data . . . 17
Appendix 3 - Acronyms and Abbreviations . . . 18

Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI

Size (ha)	11,221.47
Local Government(s)	Scenic Rim Regional, Logan City, Ipswich City
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Logan-Albert, Brisbane



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

    • Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

    • Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

    • Category R areas on the regulated vegetation management map;

    • Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

    • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Referable Wetlands under the Environmental Protection Regulation 2008;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0.0 ha	0.0 %
1b Protected Areas- nature refuges	15.03 ha	0.1%
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	70.68 ha	0.6%
6a High Ecological Value (HEV) wetlands	0.0 ha	0.0 %
6b High Ecological Value (HEV) waterways **	0.0 km	Not applicable
7 Threatened species and Iconic species	1292.18 ha	11.5%
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	825.13 ha	7.4%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	1653.46 ha	14.7%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0.0 ha	0.0 %
8d Regulated Vegetation - Essential habitat	2506.44 ha	22.3%
8e Regulated Vegetation - intersecting a watercourse **	247.8 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	442.18 ha	3.9%
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(no results)

1b. Protected Areas - nature refuges

Name
Gum Tips Nature Refuge

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Referable Wetlands

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Referable Wetlands are present.

6a. High Ecological Value (HEV) waters - wetlands

(no results)

6b. High Ecological Value (HEV) waters - waterways

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7. Threatened wildlife and special least concern animal

Threatened species and iconic species	Act	Species least concern animal	Koala Bushland Habitat	Dugong Protection	VMA Essential 2014 Habitat
Threat wildlife & Spec LeastC animals	NCA, VMA	None	Koala Bushland	None	Essential
Threat wildlife & Spec LeastC animals	NCA, VMA	None	None	None	Essential
Threat wildlife & Spec LeastC animals	NCA	None	Koala Bushland	None	None
Threat wildlife & Spec LeastC animals	NCA, VMA	None	Koala Bushland	None	None
Threat wildlife & Spec LeastC animals	NCA, VMA	None	None	None	None
Threat wildlife & Spec LeastC animals	NCA, VMA	None	None	None	Essential Regrowth

Threatened and special least concern species records

Scientific name	Common name	NCA status	EPBC status
Petrogale penicillata	brush-tailed rock-wallaby	V	V
Cupaniopsis tomentella	Boonah tuckeroo	V	V
Planchonella eerwah	None	E	E

Note: The Threatened and Special Least Concern Animal (7) layer originates from the previous MSES version (4.1, dated at 2014). The layer does not represent all currently listed species and is subject to review.

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

To request a species list for an area, or search for a species profile, access Wildlife Online at:
https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3 - MSES - Species** for an overview of the relevant MSES.

MSES - Regulated Vegetation

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.3.19	E-dom	rem_end
12.9-10.3	O-dom	rem_oc
12.3.8	O-dom	rem_oc
12.3.3d	E-dom	rem_end
12.3.18	E-dom	rem_end
12.9-10.27	E-dom	rem_end
12.9-10.2/12.9-10.7	O-subdom	rem_oc
12.3.3	E-dom	rem_end
12.9-10.2/12.9-10.7/12.9-10.17	O-subdom	rem_oc

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.9-10.7	O-dom	rem_oc
12.3.3/12.3.7	E-dom	rem_end
12.9-10.2/12.9-10.17a/12.9-10.16	O-subdom	rem_oc
12.9-10.16	O-dom	rem_oc
12.9-10.2/12.9-10.7/12.9-10.3/12.9-10.17a	O-subdom	rem_oc
12.9-10.2/12.9-10.7/12.9-10.17a/12.9-10.3	O-subdom	rem_oc
12.9-10.2/12.9-10.7/12.9-10.17a	O-subdom	rem_oc
12.9-10.2/12.9-10.7/12.9-10.17a/12.9-10.16	O-subdom	rem_oc
12.3.3/12.3.8	E-dom	rem_end
12.9-10.11	E-dom	rem_end

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
12.9-10.2/12.9-10.7/12.9-10.19/12.9-10.5/12.9-10.3	O-subdom	hvr_oc
12.9-10.2/12.9-10.7	O-subdom	hvr_oc
12.3.3d	E-dom	hvr_end
12.3.3	E-dom	hvr_end
12.9-10.3	O-dom	hvr_oc
12.3.18	E-dom	hvr_end
12.3.19	E-dom	hvr_end
12.9-10.7	O-dom	hvr_oc
12.9-10.27	E-dom	hvr_end
12.3.3d/12.3.3	E-dom	hvr_end
12.9-10.11	E-dom	hvr_end
12.3.8	O-dom	hvr_oc
12.3.3/12.3.7	E-dom	hvr_end
12.9-10.2/12.9-10.7/12.9-10.17	O-subdom	hvr_oc
12.9-10.2/12.9-10.7/12.9-10.17a/12.9-10.16	O-subdom	hvr_oc
12.9-10.15/12.9-10.17	E-dom	hvr_end
12.9-10.2/12.9-10.7/12.9-10.17a/12.9-10.3	O-subdom	hvr_oc
12.9-10.2/12.9-10.17a/12.9-10.16	O-subdom	hvr_oc
12.9-10.2/12.9-10.3	O-subdom	hvr_oc

For further information relating to regional ecosystems in general, go to:
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/
For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:
https://environment.ehp.qld.gov.au/regional-ecosystems/

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Not applicable

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Regulated vegetation map category	Map number	RVM rule
B	9442	2
C	9442	3
C	0	3
B	0	2
A	0	1
A	9442	1

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

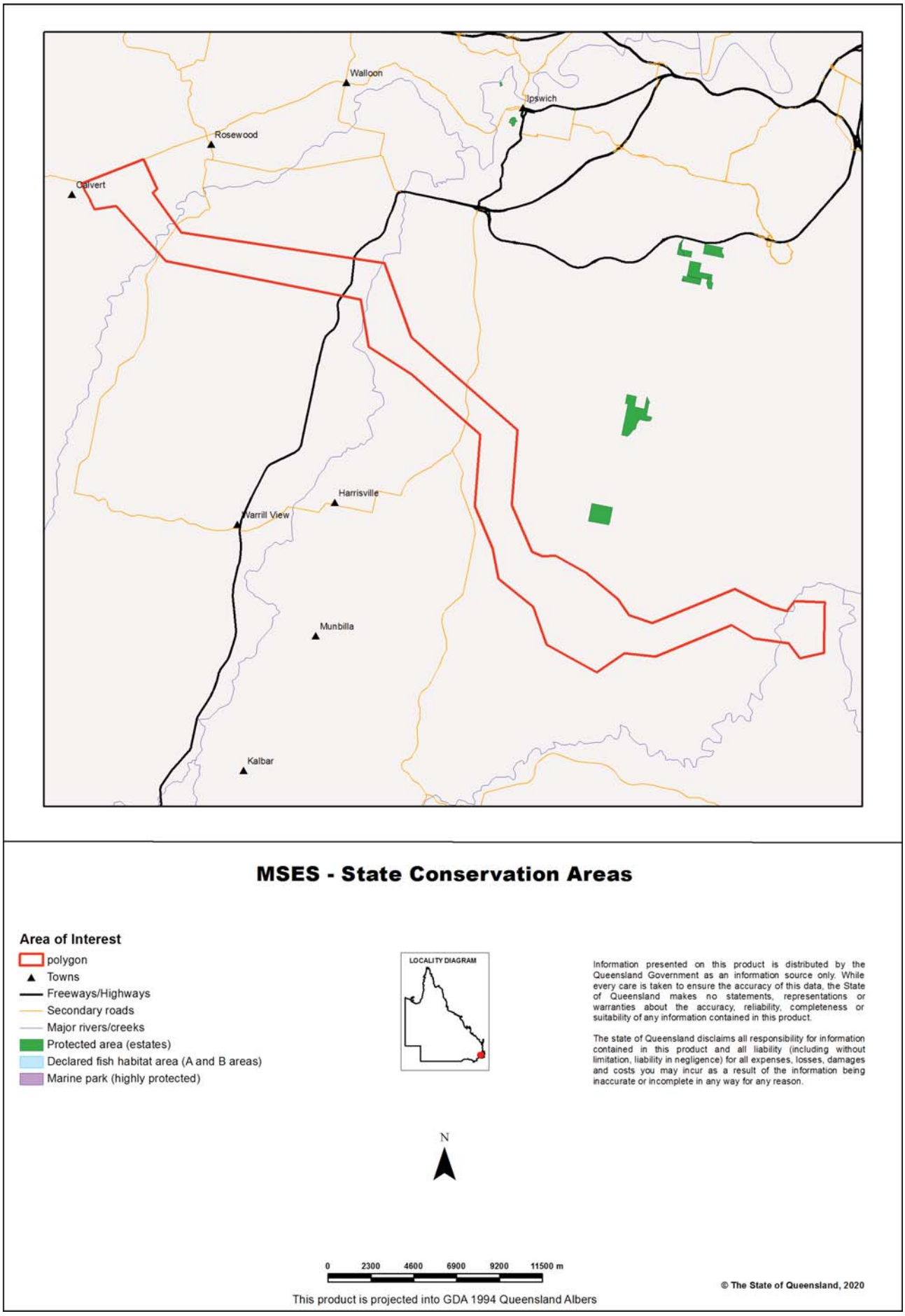
(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

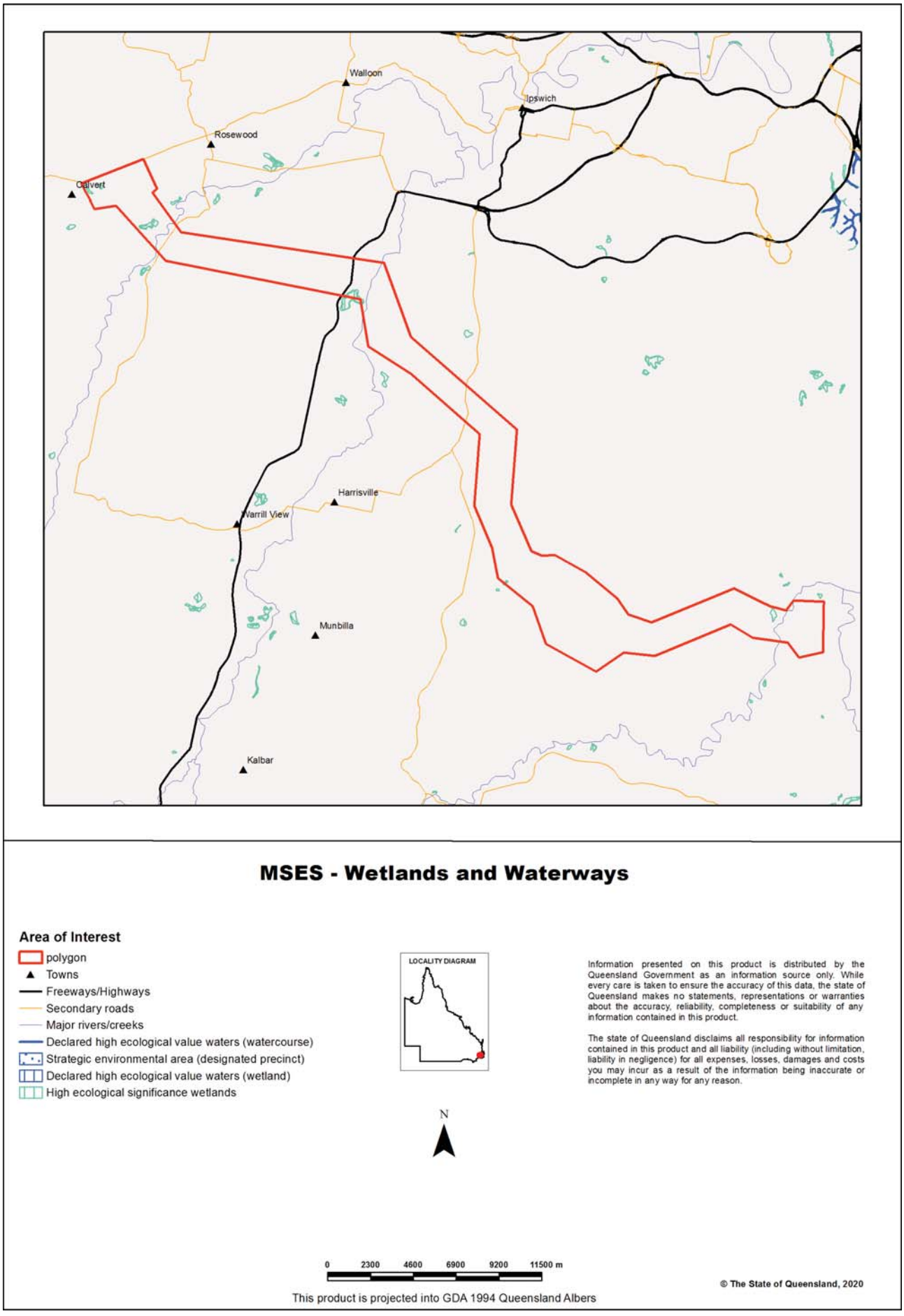
(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

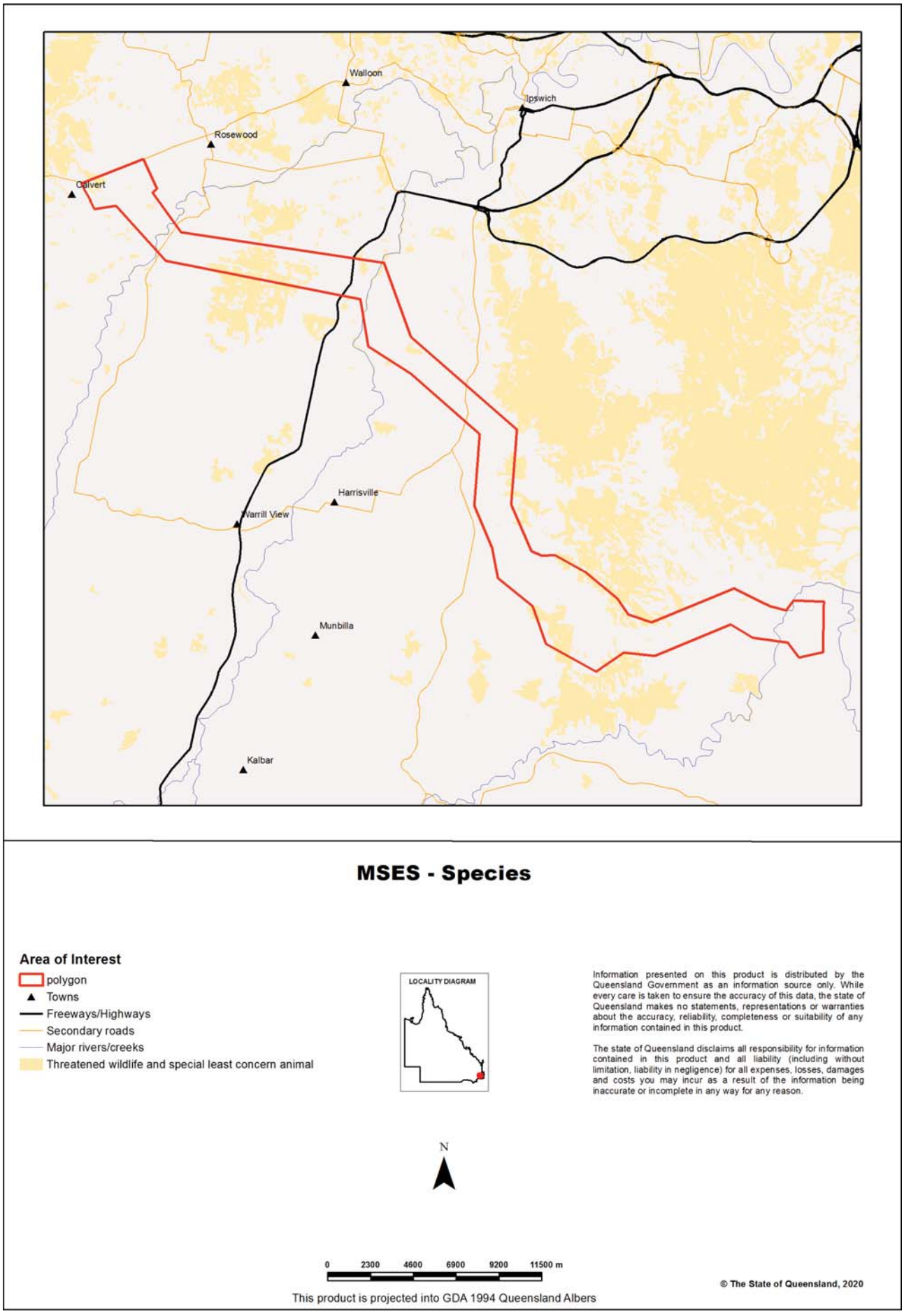
Map 1 - MSES - State Conservation Areas



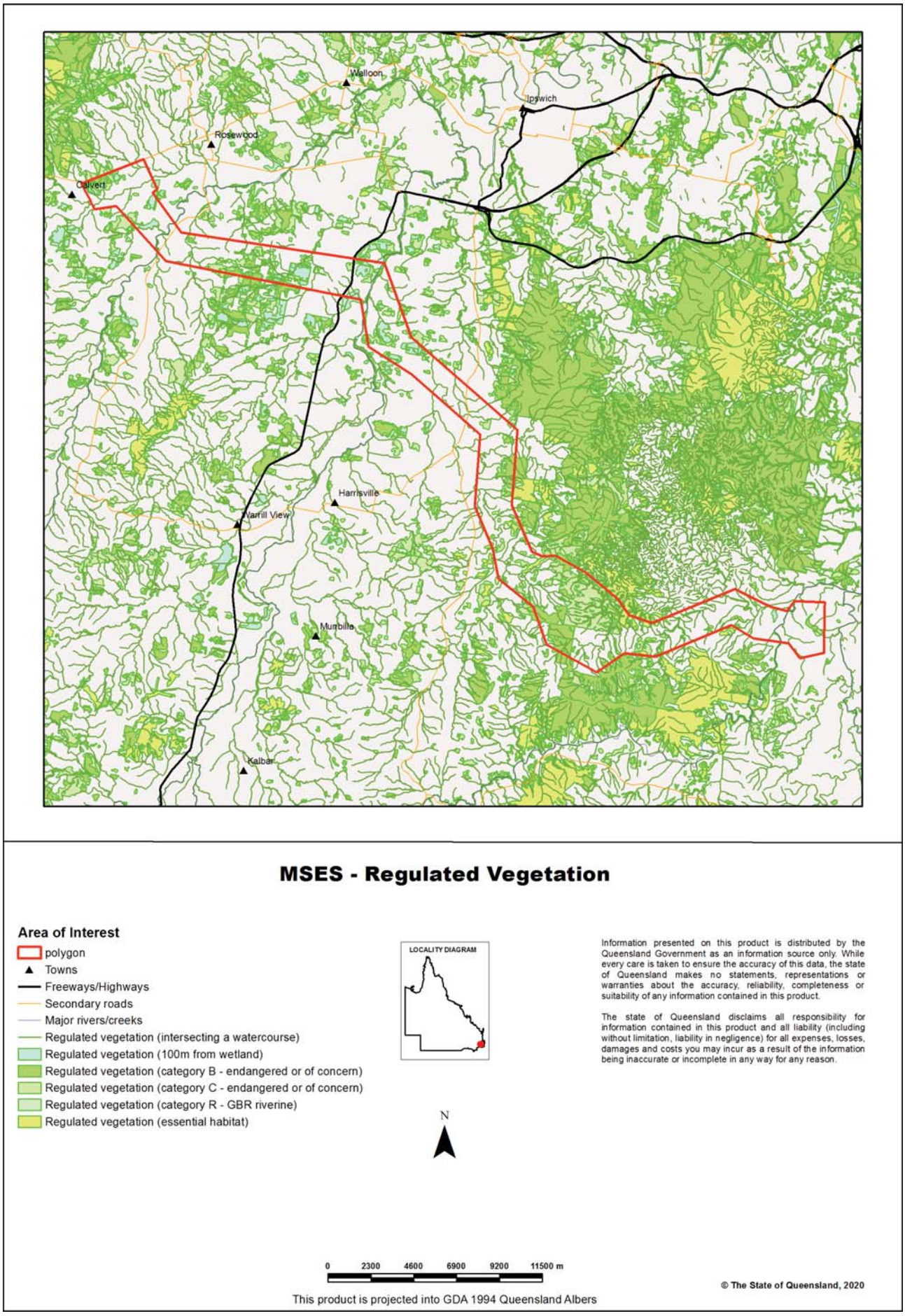
Map 2 - MSES - Wetlands and Waterways



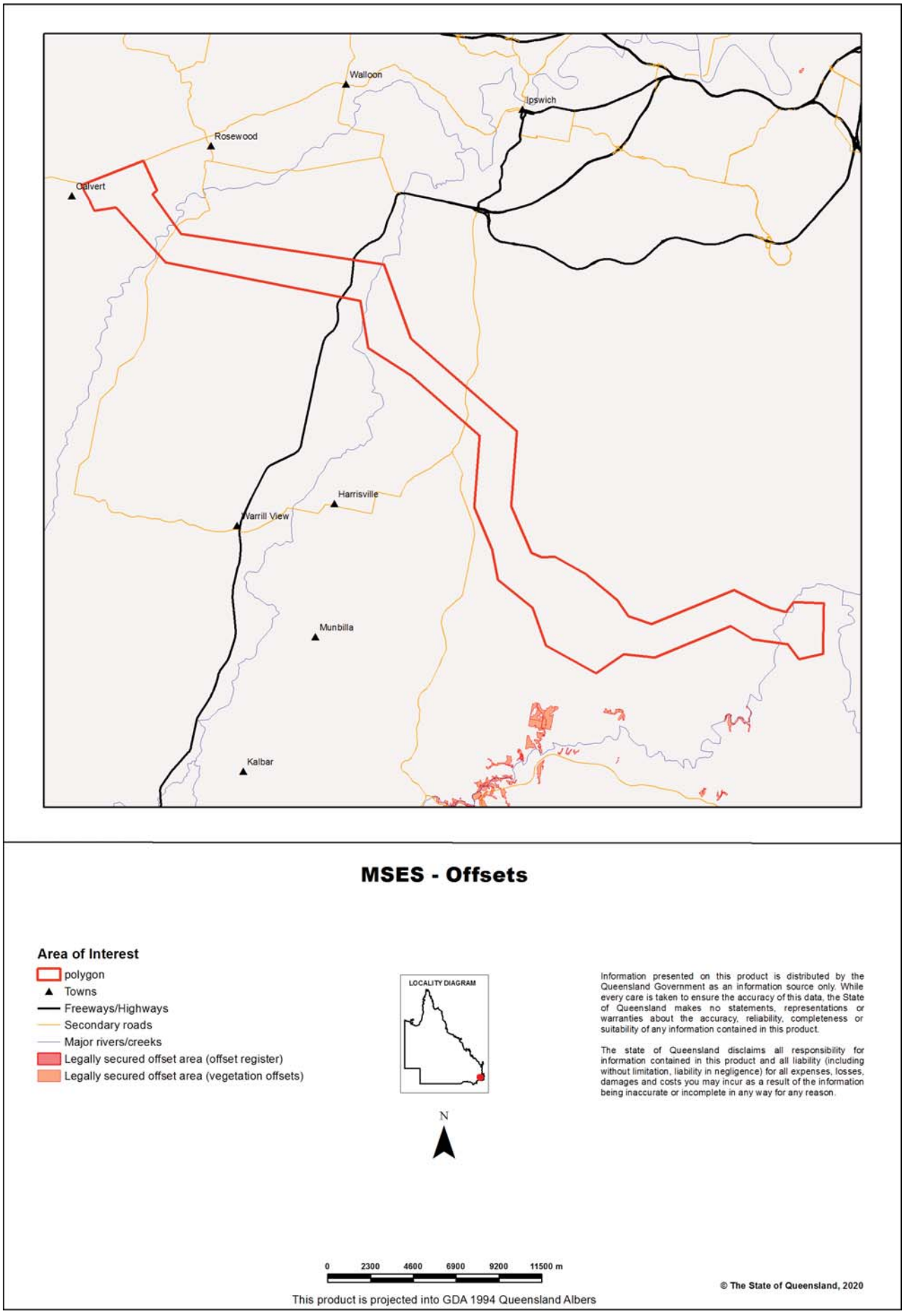
Map 3 - MSES - Species



Map 4 - MSES - Regulated Vegetation



Map 5 - MSES - Offset Areas



Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates and Nature Refuges	- Protected areas of Queensland - Nature Refuges - Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Referable Wetland - wetland layers: - Wetland management area wetlands - Wetland protection area wetlands
wetlands in HEV waters	HEV waters: - EPP Water (multiple locations) intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 4, 2015) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000) - latest version 1.4
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various)
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map - latest version 8.0
VMA Essential Habitat	Vegetation management - essential habitat map - latest version 4.41
VMA Wetlands	Vegetation management wetlands map - latest version 2.41
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map - latest version 1.41

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- *Environmental Protection Act 1994*
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- *Vegetation Management Act 1999*

Atlas of Living Australia flora and fauna species records within the Ecology Study area

Accessed: 7th February 2020, 08:50 AEDT

Kingdom	Family	Species	Common Name	NCA Status	EPBC Status
Animals	Acanthizidae	Acanthiza chrysorrhoa	yellow-rumped thornbill	C	
Animals	Acanthizidae	Acanthiza lineata	striated thornbill	C	
Animals	Acanthizidae	Acanthiza nana	yellow thornbill	C	
Animals	Acanthizidae	Acanthiza pusilla	brown thornbill	C	
Animals	Acanthizidae	Acanthiza reguloides	buff-rumped thornbill	C	
Animals	Acanthizidae	Gerygone mouki	brown gerygone	C	
Animals	Acanthizidae	Gerygone olivacea	white-throated gerygone	C	
Animals	Acanthizidae	Gerygone olivacea	white-throated gerygone	C	
Animals	Acanthizidae	Sericornis citreogularis	yellow-throated scrubwren	C	
Animals	Acanthizidae	Sericornis frontalis	white-browed scrubwren	C	
Animals	Acanthizidae	Smicrornis brevirostris	weebill	C	
Animals	Accipitridae	Accipiter cirrocephalus	collared sparrowhawk	C	
Animals	Accipitridae	Accipiter fasciatus	brown goshawk	C	
Animals	Accipitridae	Accipiter novaehollandiae	grey goshawk	C	
Animals	Accipitridae	Aquila audax	wedge-tailed eagle	C	
Animals	Accipitridae	Aviceda subcristata	Pacific baza	C	
Animals	Accipitridae	Circus approximans	swamp harrier	C	
Animals	Accipitridae	Circus assimilis	spotted harrier	C	
Animals	Accipitridae	Elanus axillaris	black-shouldered kite	C	
Animals	Accipitridae	Haliastur sphenurus	whistling kite	C	
Animals	Accipitridae	Hieraaetus morphnoides	little eagle	C	
Animals	Accipitridae	Lophoictinia isura	square-tailed kite	C	

Animals	Accipitridae	Milvus migrans	black kite	C	
Animals	Acrocephalidae	Acrocephalus australis	Australian reed-warbler	C	
Animals	Aegothelidae	Aegotheles cristatus	Australian owlet-nightjar	C	
Animals	Agamidae	Intellagama lesueurii	eastern water dragon	C	
Animals	Agamidae	Pogona barbata	bearded dragon	C	
Animals	Alaudidae	Mirafra javanica	Horsfield's bushlark	C	
Animals	Alcedinidae	Ceyx azureus	azure kingfisher	C	
Animals	Ambassidae	Ambassis agassizii	Agassiz's glassfish		
Animals	Anatidae	Anas castanea	chestnut teal	C	
Animals	Anatidae	Anas gracilis	grey teal	C	
Animals	Anatidae	Anas superciliosa	Pacific black duck	C	
Animals	Anatidae	Aythya australis	hardhead	C	
Animals	Anatidae	Chenonetta jubata	Australian wood duck	C	
Animals	Anatidae	Cygnus atratus	black swan	C	
Animals	Anatidae	Dendrocygna eytoni	plumed whistling-duck	C	
Animals	Anatidae	Malacorhynchus membranaceus	pink-eared duck	C	
Animals	Apodidae	Hirundapus caudacutus	white-throated needletail	V	V
Animals	Ardeidae	Ardea intermedia	intermediate egret	C	
Animals	Ardeidae	Ardea pacifica	white-necked heron	C	
Animals	Ardeidae	Egretta novaehollandiae	white-faced heron	C	
Animals	Artamidae	Artamus leucorynchus	white-breasted woodswallow	C	
Animals	Artamidae	Artamus personatus	masked woodswallow	C	
Animals	Artamidae	Artamus superciliosus	white-browed woodswallow	C	
Animals	Artamidae	Cracticus nigrogularis	pied butcherbird	C	
Animals	Artamidae	Cracticus torquatus	grey butcherbird	C	
Animals	Atherinidae	Craterocephalus stercusmuscarum	flyspecked hardyhead		

Animals	Bovidae	Bos taurus	European cattle		
Animals	Bufonidae	Rhinella marina	cane toad		
Animals	Burhinidae	Burhinus grallarius	bush stone-curlew	C	
Animals	Cacatuidae	Cacatua galerita	sulphur-crested cockatoo	C	
Animals	Cacatuidae	Cacatua sanguinea	little corella	C	
Animals	Cacatuidae	Cacatua tenuirostris	long-billed corella	C	
Animals	Cacatuidae	Eolophus roseicapilla	galah	C	
Animals	Cacatuidae	Nymphicus hollandicus	cockatiel	C	
Animals	Campephagidae	Coracina novaehollandiae	black-faced cuckoo-shrike	C	
Animals	Campephagidae	Coracina papuensis	white-bellied cuckoo-shrike	C	
Animals	Campephagidae	Coracina tenuirostris	cicadabird	C	
Animals	Campephagidae	Lalage leucomela	varied triller	C	
Animals	Canidae	Vulpes vulpes	red fox		
Animals	Chelidae	Chelodina longicollis	eastern snake-necked turtle	C	
Animals	Ciconiidae	Ephippiorhynchus asiaticus	black-necked stork	C	
Animals	Cisticolidae	Cisticola exilis	golden-headed cisticola	C	
Animals	Climacteridae	Climacteris erythrops	red-browed treecreeper	C	
Animals	Colubridae	Dendrelaphis punctulatus	green tree snake	C	
Animals	Columbidae	Geopelia humeralis	bar-shouldered dove	C	
Animals	Columbidae	Geopelia striata	peaceful dove	C	
Animals	Columbidae	Geopelia striata	peaceful dove	C	
Animals	Columbidae	Leucosarcia melanoleuca	wonga pigeon	C	
Animals	Columbidae	Lopholaimus antarcticus	topknot pigeon	C	
Animals	Columbidae	Macropygia amboinensis	brown cuckoo-dove	C	
Animals	Columbidae	Ocyphaps lophotes	crested pigeon	C	
Animals	Columbidae	Phaps chalcoptera	common bronzewing	C	

Animals	Columbidae	Ptilinopus magnificus	wompoo fruit-dove	C	
Animals	Columbidae	Streptopelia chinensis	spotted dove		
Animals	Coraciidae	Eurystomus orientalis	dollarbird	C	
Animals	Corvidae	Corvus coronoides	Australian raven	C	
Animals	Corvidae	Corvus orru	Torresian crow	C	
Animals	Cuculidae	Cacomantis flabelliformis	fan-tailed cuckoo	C	
Animals	Cuculidae	Cacomantis pallidus	pallid cuckoo	C	
Animals	Cuculidae	Cacomantis variolosus	brush cuckoo	C	
Animals	Cuculidae	Centropus phasianinus	pheasant coucal	C	
Animals	Cuculidae	Chalcites basalis	Horsfield's bronze-cuckoo	C	
Animals	Cuculidae	Chalcites lucidus	shining bronze-cuckoo	C	
Animals	Cuculidae	Eudynamys orientalis	eastern koel	C	
Animals	Cuculidae	Eudynamys orientalis	eastern koel	C	
Animals	Cuculidae	Scythrops novaehollandiae	channel-billed cuckoo	C	
Animals	Cyprinidae	Carassius auratus	goldfish		
Animals	Dasyuridae	Planigale maculata	common planigale	C	
Animals	Diplodactylidae	Nebulifera robusta	robust velvet gecko	C	
Animals	Elapidae	Cryptophis nigrescens	eastern small-eyed snake	C	
Animals	Elapidae	Hoplocephalus bitorquatus	pale-headed snake	C	
Animals	Elapidae	Pseudechis porphyriacus	red-bellied black snake	C	
Animals	Elapidae	Pseudonaja textilis	eastern brown snake	C	
Animals	Eleotridae	Gobiomorphus australis	striped gudgeon		
Animals	Eleotridae	Hypseleotris compressa	empire gudgeon		
Animals	Eleotridae	Hypseleotris galii	firetail gudgeon		
Animals	Eleotridae	Hypseleotris klunzingeri	western carp gudgeon		
Animals	Eleotridae	Philypnodon grandiceps	flathead gudgeon		
Animals	Eleotridae	Philypnodon macrostomus	dwarf flathead gudgeon		

Animals	Estrildidae	Lonchura castaneothorax	chestnut-breasted mannikin	C	
Animals	Estrildidae	Lonchura punctulata	nutmeg mannikin		
Animals	Estrildidae	Neochmia temporalis	red-browed finch	C	
Animals	Falconidae	Falco berigora	brown falcon	C	
Animals	Falconidae	Falco cenchroides	nankeen kestrel	C	
Animals	Falconidae	Falco longipennis	Australian hobby	C	
Animals	Falconidae	Falco peregrinus	peregrine falcon	C	
Animals	Gekkonidae	Gehyra dubia	dubious dtella	C	
Animals	Gomphidae	Hemigomphus gouldii	southern vicetail		
Animals	Halcyonidae	Dacelo leachii	blue-winged kookaburra	C	
Animals	Halcyonidae	Dacelo novaeguineae	laughing kookaburra	C	
Animals	Halcyonidae	Todiramphus macleayii	forest kingfisher	C	
Animals	Halcyonidae	Todiramphus sanctus	sacred kingfisher	C	
Animals	Hirundinidae	Hirundo neoxena	welcome swallow	C	
Animals	Hirundinidae	Petrochelidon ariel	fairy martin	C	
Animals	Hirundinidae	Petrochelidon nigricans	tree martin	C	
Animals	Hylidae	Litoria brevipalmata	green thighed frog	C	
Animals	Hylidae	Litoria caerulea	common green treefrog	C	
Animals	Hylidae	Litoria dentata	bleating treefrog	C	
Animals	Hylidae	Litoria fallax	eastern sedgefrog	C	
Animals	Hylidae	Litoria latopalmata	broad palmed rocketfrog	C	
Animals	Hylidae	Litoria nasuta	striped rocketfrog	C	
Animals	Hylidae	Litoria peronii	emerald spotted treefrog	C	
Animals	Hylidae	Litoria rubella	ruddy treefrog	C	
Animals	Jacanidae	Irediparra gallinacea	comb-crested jacana	C	
Animals	Leporidae	Lepus europaeus	European brown hare		
Animals	Limnodynastidae	Limnodynastes peronii	striped marshfrog	C	
Animals	Limnodynastidae	Limnodynastes salmini	salmon striped frog	C	

Animals	Limnodynastidae	Limnodynastes tasmaniensis	spotted grassfrog	C	
Animals	Limnodynastidae	Limnodynastes terraereginae	scarlet sided pobblebonk	C	
Animals	Macropodidae	Macropus giganteus	eastern grey kangaroo	C	
Animals	Macropodidae	Macropus rufogriseus	red-necked wallaby	C	
Animals	Macropodidae	Petrogale penicillata	brush-tailed rock-wallaby	V	V
Animals	Maluridae	Malurus cyaneus	superb fairy-wren	C	
Animals	Maluridae	Malurus lamberti	variegated fairy-wren	C	
Animals	Maluridae	Malurus melanocephalus	red-backed fairy-wren	C	
Animals	Megaluridae	Megalurus gramineus	little grassbird	C	
Animals	Megaluridae	Megalurus timoriensis	tawny grassbird	C	
Animals	Megapodiidae	Alectura lathami	Australian brush-turkey	C	
Animals	Melanotaeniidae	Melanotaenia duboulayi	crimsonspotted rainbowfish		
Animals	Meliphagidae	Acanthorhynchus tenuirostris	eastern spinebill	C	
Animals	Meliphagidae	Caligavis chrysops	yellow-faced honeyeater	C	
Animals	Meliphagidae	Entomyzon cyanotis	blue-faced honeyeater	C	
Animals	Meliphagidae	Lichmera indistincta	brown honeyeater	C	
Animals	Meliphagidae	Manorina melanocephala	noisy miner	C	
Animals	Meliphagidae	Meliphaga lewinii	Lewin's honeyeater	C	
Animals	Meliphagidae	Melithreptus albogularis	white-throated honeyeater	C	
Animals	Meliphagidae	Melithreptus lunatus	white-naped honeyeater	C	
Animals	Meliphagidae	Myzomela sanguinolenta	scarlet honeyeater	C	
Animals	Meliphagidae	Philemon citreogularis	little friarbird	C	
Animals	Meliphagidae	Philemon corniculatus	noisy friarbird	C	

Animals	Meliphagidae	Plectorhyncha lanceolata	striped honeyeater	C	
Animals	Meliphagidae	Ptilotula fusca	fuscous honeyeater	C	
Animals	Meropidae	Merops ornatus	rainbow bee-eater	C	
Animals	Monarchidae	Grallina cyanoleuca	magpie-lark	C	
Animals	Monarchidae	Monarcha melanopsis	black-faced monarch	SL	
Animals	Monarchidae	Myiagra inquieta	restless flycatcher	C	
Animals	Monarchidae	Myiagra rubecula	leaden flycatcher	C	
Animals	Motacillidae	Anthus novaeseelandiae	Australasian pipit	C	
Animals	Muridae	Rattus rattus	black rat		
Animals	Myobatrachidae	Crinia parinsignifera	beeping froglet	C	
Animals	Myobatrachidae	Pseudophryne major	great brown broodfrog	C	
Animals	Myobatrachidae	Uperoleia rugosa	chubby gungan	C	
Animals	Nectariniidae	Dicaeum hirundinaceum	mistletoebird	C	
Animals	Neosittidae	Daphoenositta chrysoptera	varied sittella	C	
Animals	Oriolidae	Oriolus sagittatus	olive-backed oriole	C	
Animals	Oriolidae	Sphecotheres vieilloti	Australasian figbird	C	
Animals	Orthonychidae	Orthonyx temminckii	Australian logrunner	C	
Animals	Pachycephalidae	Colluricincla harmonica	grey shrike-thrush	C	
Animals	Pachycephalidae	Colluricincla megarhyncha	little shrike-thrush	C	
Animals	Pachycephalidae	Pachycephala rufiventris	rufous whistler	C	
Animals	Paradisaeidae	Ptiloris paradiseus	paradise riflebird	C	
Animals	Pardalotidae	Pardalotus punctatus	spotted pardalote	C	
Animals	Pardalotidae	Pardalotus striatus	striated pardalote	C	
Animals	Peramelidae	Isoodon macrourus	northern brown bandicoot	C	
Animals	Percichthyidae	Macquaria novemaculeata	Australian bass		
Animals	Petauridae	Petaurus breviceps	sugar glider	C	
Animals	Petauridae	Petaurus norfolcensis	squirrel glider	C	
Animals	Petroicidae	Eopsaltria australis	eastern yellow robin	C	

Animals	Petroicidae	Microeca fascinans	jacky winter	C	
Animals	Petroicidae	Petroica goodenovii	red-capped robin	C	
Animals	Petroicidae	Petroica rosea	rose robin	C	
Animals	Petroicidae	Tregellasia capito	pale-yellow robin	C	
Animals	Phalangeridae	Trichosurus vulpecula	common brushtail possum	C	
Animals	Phascolarctidae	Phascolarctos cinereus	koala	V	V
Animals	Phasianidae	Coturnix ypsilophora	brown quail	C	
Animals	Phasianidae	Pavo cristatus	Indian peafowl		
Animals	Pittidae	Pitta versicolor	noisy pitta	C	
Animals	Plotosidae	Tandanus tandanus	freshwater catfish		
Animals	Podargidae	Podargus strigoides	tawny frogmouth	C	
Animals	Podicipedidae	Tachybaptus novaehollandiae	Australasian grebe	C	
Animals	Psittacidae	Alisterus scapularis	Australian king-parrot	C	
Animals	Psittacidae	Glossopsitta concinna	musk lorikeet	C	
Animals	Psittacidae	Parvipsitta pusilla	little lorikeet	C	
Animals	Psittacidae	Platycercus eximius	eastern rosella	C	
Animals	Psittacidae	Trichoglossus chlorolepidotus	scaly-breasted lorikeet	C	
Animals	Psophodidae	Psophodes olivaceus	eastern whipbird	C	
Animals	Ptilonorhynchidae	Ailuroedus crassirostris	green catbird	C	
Animals	Ptilonorhynchidae	Ptilonorhynchus violaceus	satin bowerbird	C	
Animals	Ptilonorhynchidae	Sericulus chrysocephalus	regent bowerbird	C	
Animals	Pygopodidae	Delma plebeia	common delma	C	
Animals	Rallidae	Fulica atra	Eurasian coot	C	
Animals	Rallidae	Gallinula tenebrosa	dusky moorhen	C	
Animals	Rallidae	Gallirallus philippensis	buff-banded rail	C	
Animals	Retropinnidae	Retropinna semoni	Australian smelt		
Animals	Rhipiduridae	Rhipidura albiscapa	grey fantail	C	
Animals	Rhipiduridae	Rhipidura rufifrons	rufous fantail	SL	

Animals	Scincidae	Anomalopus verreauxii	three-clawed worm-skink	C	
Animals	Scincidae	Carlia vivax	tussock rainbow-skink	C	
Animals	Scincidae	Ctenotus spaldingi	straight-browed ctenotus	C	
Animals	Scincidae	Lampropholis delicata	dark-flecked garden sunskink	C	
Animals	Strigidae	Ninox strenua	powerful owl	V	
Animals	Sturnidae	Acridotheres tristis	common myna		
Animals	Sturnidae	Acridotheres tristis	common myna		
Animals	Sturnidae	Sturnus vulgaris	common starling		
Animals	Tachyglossidae	Tachyglossus aculeatus	short-beaked echidna	SL	
Animals	Terapontidae	Leiopotherapon unicolor	spangled perch		
Animals	Threskiornithidae	Plegadis falcinellus	glossy ibis	SL	
Animals	Threskiornithidae	Threskiornis spinicollis	straw-necked ibis	C	
Animals	Turdidae	Zoothera heinei	russet-tailed thrush	C	
Animals	Typhlopidae	Anilios wiedii	brown-snouted blind snake	C	
Fungi	Agaricaceae	Bovista cunninghamii		C	
Fungi	Agaricaceae	Chlorophyllum molybdites	green-spored parasol	C	
Fungi	Agaricaceae	Podaxis beringamensis		C	
Fungi	Amanitaceae	Amanita vaginata		C	
Fungi	Cladoniaceae	Cladonia floerkeana		C	
Fungi	Cladoniaceae	Thysanothecium scutellatum		C	
Fungi	Sclerodermataceae	Pisolithus marmoratus		C	
Plants	Acanthaceae	Brunoniella australis	blue trumpet	C	
Plants	Adoxaceae	Sambucus gaudichaudiana	white elder	C	
Plants	Alismataceae	Damasonium minus	starfruit	C	
Plants	Amaranthaceae	Achyranthes aspera		C	
Plants	Amaranthaceae	Gomphrena celosioides	gomphrena weed		
Plants	Apiaceae	Centella asiatica		C	

Plants	Apocynaceae	Alstonia constricta	bitterbark	C	
Plants	Apocynaceae	Gomphocarpus physocarpus	balloon cottonbush		
Plants	Apocynaceae	Marsdenia coronata	slender milkvine	V	
Plants	Apocynaceae	Parsonsia straminea	monkey rope	C	
Plants	Asteraceae	Apowollastonia spilanthoides		C	
Plants	Asteraceae	Baccharis halimifolia	groundsel bush		
Plants	Asteraceae	Camptacra barbata		C	
Plants	Asteraceae	Cassinia laevis		C	
Plants	Asteraceae	Cirsium vulgare	spear thistle		
Plants	Asteraceae	Cyanthillium cinereum		C	
Plants	Asteraceae	Erigeron bonariensis			
Plants	Asteraceae	Euchiton japonicus		C	
Plants	Asteraceae	Euchiton sphaericus		C	
Plants	Asteraceae	Glossocardia bidens	native cobbler's pegs	C	
Plants	Asteraceae	Lagenophora fimbriata		C	
Plants	Asteraceae	Lagenophora gracilis		C	
Plants	Asteraceae	Ozothamnus diosmifolius	white dogwood	C	
Plants	Asteraceae	Senecio madagascariensis	fireweed		
Plants	Asteraceae	Solenogyne bellioides		C	
Plants	Asteraceae	Tagetes minuta	stinking roger		
Plants	Asteraceae	Vittadinia sulcata	native daisy	C	
Plants	Bignoniaceae	Pandorea pandorana	wonga vine	C	
Plants	Brassicaceae	Lepidium africanum	common peppercress		
Plants	Bryaceae	Rosulabryum subfasciculatum		C	
Plants	Cactaceae	Opuntia stricta			
Plants	Cactaceae	Opuntia tomentosa	velvety tree pear		
Plants	Caesalpiniaceae	Barklya syringifolia	golden shower tree	C	
Plants	Campanulaceae	Lobelia concolor		C	

Plants	Campanulaceae	Lobelia purpurascens	white root	C	
Plants	Campanulaceae	Lobelia stenophylla		C	
Plants	Campanulaceae	Wahlenbergia gracilis	sprawling bluebell	C	
Plants	Chenopodiaceae	Dysphania multifida			
Plants	Chenopodiaceae	Einadia polygonoides	knotweed goosefoot	C	
Plants	Chenopodiaceae	Maireana microphylla		C	
Plants	Clusiaceae	Hypericum gramineum		C	
Plants	Commelinaceae	Commelina diffusa	wandering jew	C	
Plants	Commelinaceae	Murdannia graminea	murdannia	C	
Plants	Convolvulaceae	Dichondra repens	kidney weed	C	
Plants	Crassulaceae	Bryophyllum delagoense			
Plants	Cupressaceae	Callitris baileyi	Bailey's cypress	NT	
Plants	Cyperaceae	Bolboschoenus fluviatilis		C	
Plants	Cyperaceae	Carex appressa		C	
Plants	Cyperaceae	Carex inversa	knob sedge	C	
Plants	Cyperaceae	Cyperus flaccidus		C	
Plants	Cyperaceae	Cyperus mirus		C	
Plants	Cyperaceae	Cyperus scariosus		C	
Plants	Cyperaceae	Cyperus sculptus		C	
Plants	Cyperaceae	Cyperus sesquiflorus			
Plants	Cyperaceae	Cyperus trinervis		C	
Plants	Cyperaceae	Eleocharis dietrichiana		C	
Plants	Cyperaceae	Eleocharis philippinensis		C	
Plants	Cyperaceae	Fimbristylis dichotoma	common fringe-rush	C	
Plants	Cyperaceae	Fimbristylis ferruginea		C	
Plants	Entodontaceae	Entodon mackaviensis		C	
Plants	Euphorbiaceae	Homalanthus stillingiifolius		C	
Plants	Fabaceae	Desmodium brachypodum	large ticktrefoil	C	
Plants	Fabaceae	Desmodium rhytidophyllum		C	
Plants	Fabaceae	Hardenbergia violacea		C	

Plants	Fabaceae	Indigofera linnaei	Birdsville indigo	C	
Plants	Fabaceae	Jacksonia scoparia		C	
Plants	Funariaceae	Funaria hygrometrica		C	
Plants	Goodeniaceae	Goodenia gracilis		C	
Plants	Goodeniaceae	Velleia paradoxa	spur velleia	C	
Plants	Hemerocallidaceae	Dianella brevipedunculata		C	
Plants	Hemerocallidaceae	Dianella rara		C	
Plants	Johnsoniaceae	Tricoryne elatior	yellow autumn lily	C	
Plants	Juncaceae	Juncus polyanthemus		C	
Plants	Juncaceae	Juncus usitatus		C	
Plants	Lamiaceae	Callicarpa longifolia		C	
Plants	Lamiaceae	Mentha satureioides	native pennyroyal	C	
Plants	Lentibulariaceae	Utricularia aurea	golden bladderwort	C	
Plants	Linderniaceae	Lindernia alsinoides		C	
Plants	Lythraceae	Ammannia multiflora	jerry-jerry	C	
Plants	Malvaceae	Sida rhombifolia			
Plants	Marsileaceae	Marsilea mutica	shiny nardoo	C	
Plants	Menyanthaceae	Nymphoides indica	water snowflake	C	
Plants	Mimosaceae	Acacia aulacocarpa		C	
Plants	Mimosaceae	Acacia concurrens		C	
Plants	Mimosaceae	Acacia falcata	sickle wattle	C	
Plants	Mimosaceae	Acacia maidenii	Maiden's wattle	C	
Plants	Mimosaceae	Acacia podalyriifolia	Queensland silver wattle	C	
Plants	Moraceae	Ficus obliqua		C	
Plants	Myrtaceae	Angophora leiocarpa	rusty gum	C	
Plants	Myrtaceae	Corymbia clarksoniana		C	
Plants	Myrtaceae	Corymbia tessellaris	Moreton Bay ash	C	
Plants	Myrtaceae	Eucalyptus crebra	narrow-leaved red ironbark	C	
Plants	Myrtaceae	Lophostemon suaveolens	swamp box	C	
Plants	Myrtaceae	Melaleuca irbyana		E	

Plants	Nymphaeaceae	Nymphaea gigantea		C	
Plants	Oleaceae	Jasminum dianthifolium		C	
Plants	Oleaceae	Notelaea lloydii	Lloyd's native olive	V	V
Plants	Onagraceae	Ludwigia octovalvis	willow primrose	C	
Plants	Oxalidaceae	Oxalis perennans		C	
Plants	Pentapetaceae	Melhania oblongifolia		C	
Plants	Phyllanthaceae	Phyllanthus virgatus		C	
Plants	Picrodendraceae	Petalostigma pubescens	quinine tree	C	
Plants	Plantaginaceae	Bacopa floribunda		C	
Plants	Plantaginaceae	Plantago debilis	shade plantain	C	
Plants	Poaceae	Aristida gracilipes		C	
Plants	Poaceae	Axonopus fissifolius			
Plants	Poaceae	Capillipedium spicigerum	spicytop	C	
Plants	Poaceae	Chloris gayana	rhodes grass		
Plants	Poaceae	Chloris truncata		C	
Plants	Poaceae	Chrysopogon sylvaticus		C	
Plants	Poaceae	Cymbopogon refractus	barbed-wire grass	C	
Plants	Poaceae	Digitaria ciliaris	summer grass		
Plants	Poaceae	Echinochloa colona	awnless barnyard grass		
Plants	Poaceae	Enteropogon unispiceus		C	
Plants	Poaceae	Eragrostis elongata		C	
Plants	Poaceae	Eremochloa bimaculata	poverty grass	C	
Plants	Poaceae	Eriochloa procera	slender cupgrass	C	
Plants	Poaceae	Heteropogon contortus	black speargrass	C	
Plants	Poaceae	Imperata cylindrica	blady grass	C	
Plants	Poaceae	Melinis repens	red natal grass		
Plants	Poaceae	Panicum simile		C	
Plants	Poaceae	Paspalidium caespitosum	brigalow grass	C	
Plants	Poaceae	Paspalidium distans	shotgrass	C	
Plants	Poaceae	Paspalum distichum	water couch		

Plants	Poaceae	Sporobolus creber		C	
Plants	Poaceae	Themeda triandra	kangaroo grass	C	
Plants	Poaceae	Tragus australianus	small burr grass	C	
Plants	Polygonaceae	Persicaria decipiens	slender knotweed	C	
Plants	Pontederiaceae	Eichhornia crassipes	water hyacinth		
Plants	Portulacaceae	Calandrinia pickeringii		C	
Plants	Portulacaceae	Portulaca pilosa			
Plants	Rhamnaceae	Alphitonia excelsa	soap tree	C	
Plants	Rubiaceae	Oldenlandia galioides		C	
Plants	Rubiaceae	Spermacoce multicaulis		C	
Plants	Rutaceae	Coatesia paniculata		C	
Plants	Rutaceae	Flindersia collina	broad-leaved leopard tree	C	
Plants	Santalaceae	Exocarpos cupressiformis	native cherry	C	
Plants	Sapotaceae	Planchonella eerwah		E	E
Plants	Scrophulariaceae	Eremophila debilis	winter apple	C	
Plants	Solanaceae	Solanum nigrum			
Plants	Stackhousiaceae	Stackhousia muricata		C	
Plants	Typhaceae	Typha orientalis	broad-leaved cumbungi	C	
Plants	Verbenaceae	Glandularia aristigera			
Plants	Verbenaceae	Lantana montevidensis	creeping lantana		
Plants	Verbenaceae	Verbena rigida			
Plants	Viscaceae	Notothixos incanus		C	
Plants	Viscaceae	Viscum articulatum	flat mistletoe	C	

WildNet Records
Species List

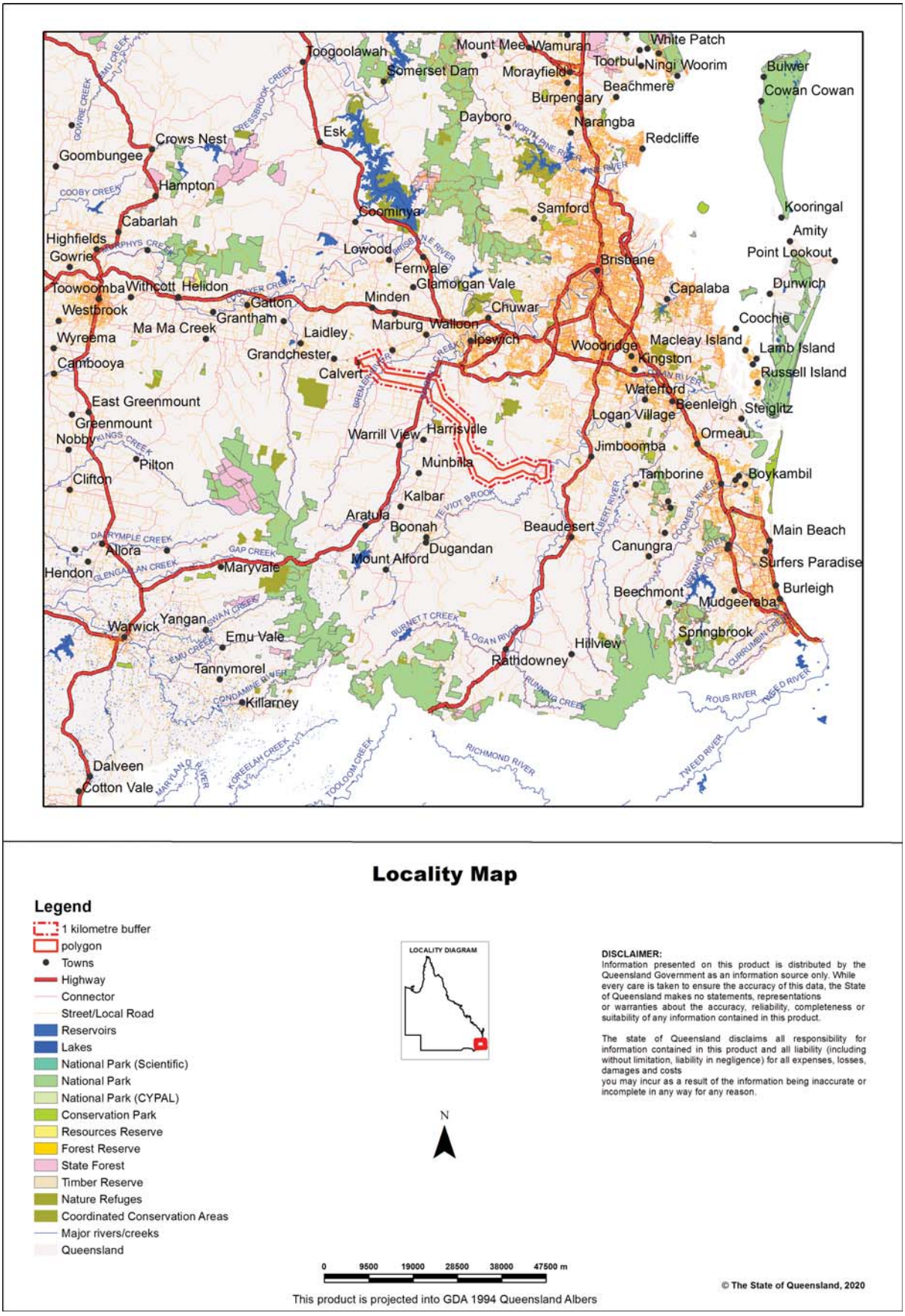
For the selected area of interest 11221.47ha

Current as at 06/02/2020

WildNetspecieslist

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest .

Table 1. Area of interest details

Size (ha)	11,221.47
Local Government(s)	Scenic Rim Regional, Logan City, Ipswich City
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Logan-Albert, Brisbane

Protected Area(s)
No estates or reserves are located within the area of interest.

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Species List

Introduction
This Species List report is derived only from records from the WildNet database managed by the Department of Environment and Science. Other data sources may provide additional information on species occurrence.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species does not occur in the report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area.

Table 2 lists the animals recorded within the area of interest and its one kilometre buffer.

Table 3 lists the plants recorded within the area of interest and its one kilometre buffer.

Table 4 lists the fungi recorded within the area of interest and its one kilometre buffer.

Table 5 lists the protists recorded within the area of interest and its one kilometre buffer.

Table 2. Animals recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26896	Actinopterygii	Ambassidae	*Ambassis agassizii*	Agassiz's glassfish	None	None	0	7	16/04/2014
26908	Actinopterygii	Anguillidae	*Anguilla australis*	southern shortfin eel	None	None	0	2	15/11/2005
26910	Actinopterygii	Anguillidae	*Anguilla reinhardtii*	longfin eel	None	None	0	15	16/04/2014
26920	Actinopterygii	Atherinidae	*Craterocephalus stercusmuscarum*	flyspecked hardyhead	None	None	0	3	16/04/2014
26938	Actinopterygii	Cichlidae	*Oreochromis mossambica*	Mozambique mouthbrooder	None	None	0	4	16/04/2014
26939	Actinopterygii	Cichlidae	*Tilapia mariae*	spotted tilapia	None	None	0	1	17/10/2012
26943	Actinopterygii	Cyprinidae	*Cyprinus carpio*	European carp	None	None	0	13	16/04/2014
26952	Actinopterygii	Eleotridae	*Gobiomorphus australis*	striped gudgeon	None	None	0	12	16/04/2014
26954	Actinopterygii	Eleotridae	*Hypseleotris compressa*	empire gudgeon	None	None	0	6	23/04/2013

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26955	Actinopterygii	Eleotridae	*Hypseleotris galii*	firetail gudgeon	None	None	0	17	16/04/2014
26956	Actinopterygii	Eleotridae	*Hypseleotris klunzingeri*	western carp gudgeon	None	None	0	9	16/04/2014
26968	Actinopterygii	Eleotridae	*Philypnodon grandiceps*	flathead gudgeon	None	None	0	11	16/04/2014
26969	Actinopterygii	Eleotridae	*Philypnodon macrostomus*	dwarf flathead gudgeon	None	None	0	3	16/04/2012
27024	Actinopterygii	Melanotaeniidae	*Melanotaenia duboulayi*	crimsonspotted rainbowfish	None	None	0	14	16/04/2014
27035	Actinopterygii	Mugilidae	*Mugil cephalus*	sea mullet	None	None	0	9	16/04/2014
27043	Actinopterygii	Percichthyidae	*Macquaria novemaculeata*	Australian bass	None	None	0	1	01/11/2010
27054	Actinopterygii	Plotosidae	*Tandanus tandanus*	freshwater catfish	None	None	0	3	02/10/2009
27055	Actinopterygii	Poeciliidae	*Gambusia holbrooki*	mosquitofish	None	None	0	17	16/04/2014
27059	Actinopterygii	Pseudomugilidae	*Pseudomugil signifer*	Pacific blue eye	None	None	0	2	21/10/2004
27061	Actinopterygii	Retropinnidae	*Retropinna semoni*	Australian smelt	None	None	0	4	16/04/2014
27089	Actinopterygii	Terapontidae	*Leiopotherapon unicolor*	spangled perch	None	None	0	8	16/04/2014
716	Amphibia	Bufonidae	*Rhinella marina*	cane toad	None	None	0	4	16/01/2004
643	Amphibia	Hylidae	*Cyclorana brevipes*	superb collared frog	C	None	0	1	16/01/2004
627	Amphibia	Hylidae	*Litoria caerulea*	common green treefrog	C	None	0	6	31/03/2015
628	Amphibia	Hylidae	*Litoria chloris*	orange eyed treefrog	C	None	0	2	31/03/2015
617	Amphibia	Hylidae	*Litoria dentata*	bleating treefrog	C	None	0	2	16/01/2004
608	Amphibia	Hylidae	*Litoria fallax*	eastern sedgefrog	C	None	0	4	16/01/2004
611	Amphibia	Hylidae	*Litoria gracilenta*	graceful treefrog	C	None	0	2	16/01/2004
614	Amphibia	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog	C	None	0	4	31/12/2010
604	Amphibia	Hylidae	*Litoria nasuta*	striped rocketfrog	C	None	0	2	31/12/1999
596	Amphibia	Hylidae	*Litoria peronii*	emerald spotted treefrog	C	None	0	1	31/12/1999
600	Amphibia	Hylidae	*Litoria rubella*	ruddy treefrog	C	None	0	3	16/01/2004
681	Amphibia	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog	C	None	0	2	31/12/1999
682	Amphibia	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog	C	None	0	1	31/12/1999
684	Amphibia	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog	C	None	0	3	16/01/2004
680	Amphibia	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog	C	None	0	1	16/01/2004
696	Amphibia	Myobatrachidae	*Crinia parinsignifera*	beeping froglet	C	None	0	2	16/01/2004
698	Amphibia	Myobatrachidae	*Crinia signifera*	clicking froglet	C	None	0	1	16/01/2004
659	Amphibia	Myobatrachidae	*Pseudophryne major*	great brown broodfrog	C	None	1	1	31/12/1994

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
639	Amphibia	Myobatrachidae	*Uperoleia rugosa*	chubby gungan	C	None	1	2	16/01/2004
1419	Aves	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill	C	None	0	7	10/02/2006
1421	Aves	Acanthizidae	*Acanthiza lineata*	striated thornbill	C	None	0	1	20/11/2002
1422	Aves	Acanthizidae	*Acanthiza nana*	yellow thornbill	C	None	0	1	31/12/1992
1423	Aves	Acanthizidae	*Acanthiza pusilla*	brown thornbill	C	None	0	1	20/11/2002
1425	Aves	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill	C	None	0	1	20/07/2002
1410	Aves	Acanthizidae	*Gerygone mouki*	brown gerygone	C	None	0	1	20/11/2002
1396	Aves	Acanthizidae	*Gerygone olivacea*	white-throated gerygone	C	None	0	11	10/02/2006
1403	Aves	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler	C	None	0	4	10/02/2006
1381	Aves	Acanthizidae	*Sericornis citreogularis*	yellow-throated scrubwren	C	None	0	1	20/11/2002
1382	Aves	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren	C	None	0	3	20/11/2002
1371	Aves	Acanthizidae	*Smicrornis brevirostris*	weebill	C	None	0	8	10/02/2006
1742	Aves	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk	C	None	0	1	20/11/2002
1729	Aves	Accipitridae	*Accipiter fasciatus*	brown goshawk	C	None	0	4	10/02/2006
1730	Aves	Accipitridae	*Accipiter novaehollandiae*	grey goshawk	C	None	0	1	20/11/2002
1732	Aves	Accipitridae	*Aquila audax*	wedge-tailed eagle	C	None	0	4	20/11/2002
1721	Aves	Accipitridae	*Aviceda subcristata*	Pacific baza	C	None	0	4	25/07/2003
1722	Aves	Accipitridae	*Circus approximans*	swamp harrier	C	None	0	2	31/12/1999
1723	Aves	Accipitridae	*Circus assimilis*	spotted harrier	C	None	0	1	24/09/1988
1725	Aves	Accipitridae	*Elanus axillaris*	black-shouldered kite	C	None	0	3	24/03/2001
1718	Aves	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle	C	None	0	3	31/12/2010
1707	Aves	Accipitridae	*Haliastur sphenurus*	whistling kite	C	None	0	2	04/11/1993
1973	Aves	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar	C	None	0	2	25/07/2003
1652	Aves	Alaudidae	*Mirafra javanica*	Horsfield's bushlark	C	None	0	2	20/07/2002
1776	Aves	Alcedinidae	*Ceyx azureus*	azure kingfisher	C	None	0	2	20/07/2002
1992	Aves	Anatidae	*Anas castanea*	chestnut teal	C	None	0	2	27/07/1999
1993	Aves	Anatidae	*Anas gracilis*	grey teal	C	None	0	7	10/02/2006
1998	Aves	Anatidae	*Anas superciliosa*	Pacific black duck	C	None	0	20	17/10/2012
1999	Aves	Anatidae	*Aythya australis*	hardhead	C	None	0	4	20/07/2002
2003	Aves	Anatidae	*Chenonetta jubata*	Australian wood duck	C	None	0	15	25/07/2003
2005	Aves	Anatidae	*Cygnus atratus*	black swan	C	None	0	3	06/05/2000

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1980	Aves	Anatidae	*Malacorhynchus membranaceus*	pink-eared duck	C	None	0	2	27/07/1999
1996	Aves	Anatidae	*Spatula rhynchotis*	Australasian shoveler	C	None	0	4	25/07/2003
1987	Aves	Anatidae	*Stictonetta naevosa*	freckled duck	C	None	0	2	14/12/1980
1279	Aves	Anhingidae	*Anhinga novaehollandiae*	Australasian darter	C	None	0	1	27/07/1999
1971	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	1	20/11/2002
1829	Aves	Ardeidae	*Ardea alba modesta*	eastern great egret	C	None	0	3	06/05/2000
1831	Aves	Ardeidae	*Ardea intermedia*	intermediate egret	C	None	0	3	06/05/2000
1832	Aves	Ardeidae	*Ardea pacifica*	white-necked heron	C	None	0	4	27/07/1999
1830	Aves	Ardeidae	*Bubulcus ibis*	cattle egret	C	None	0	9	25/11/2001
1826	Aves	Ardeidae	*Egretta novaehollandiae*	white-faced heron	C	None	0	11	20/07/2002
1654	Aves	Artamidae	*Cracticus nigrogularis*	pied butcherbird	C	None	0	19	25/09/2004
1656	Aves	Artamidae	*Cracticus torquatus*	grey butcherbird	C	None	0	14	17/10/2012
1644	Aves	Artamidae	*Gymnorhina tibicen*	Australian magpie	C	None	0	40	17/10/2012
1645	Aves	Artamidae	*Strepera graculina*	pied currawong	C	None	0	5	20/11/2002
1956	Aves	Burhinidae	*Burhinus grallarius*	bush stone-curlew	C	None	0	1	31/12/1999
1191	Aves	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	C	None	0	13	20/11/2002
1194	Aves	Cacatuidae	*Cacatua sanguinea*	little corella	C	None	0	1	10/02/2001
21967	Aves	Cacatuidae	*Cacatua tenuirostris*	long-billed corella	C	None	0	4	25/11/2001
1193	Aves	Cacatuidae	*Eolophus roseicapilla*	galah	C	None	0	21	17/10/2012
1173	Aves	Cacatuidae	*Nymphicus hollandicus*	cockatiel	C	None	0	13	31/05/2001
1636	Aves	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	C	None	0	23	24/12/2004
1639	Aves	Campephagidae	*Coracina tenuirostris*	cicadabird	C	None	0	1	20/11/2002
1640	Aves	Campephagidae	*Lalage leucomela*	varied triller	C	None	0	1	20/11/2002
1642	Aves	Campephagidae	*Lalage tricolor*	white-winged triller	C	None	0	1	31/12/1999
27774	Aves	Charadriidae	*Vanellus miles*	masked lapwing	C	None	0	2	25/07/2003
1933	Aves	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)	C	None	0	9	25/07/2003
1820	Aves	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork	C	None	0	4	05/03/2013
1294	Aves	Cisticolidae	*Cisticola exilis*	golden-headed cisticola	C	None	0	5	24/03/2001

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1626	Aves	Climacteridae	*Climacteris erythrops*	red-browed treecreeper	C	None	0	1	20/11/2002
1617	Aves	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper	C	None	0	1	20/11/2002
1810	Aves	Columbidae	*Geopelia humeralis*	bar-shouldered dove	C	None	0	9	20/07/2002
1797	Aves	Columbidae	*Geopelia striata*	peaceful dove	C	None	0	10	10/02/2006
1787	Aves	Columbidae	*Leucosarcia melanoleuca*	wonga pigeon	C	None	0	1	20/11/2002
1789	Aves	Columbidae	*Lopholaimus antarcticus*	topknot pigeon	C	None	0	1	20/11/2002
1791	Aves	Columbidae	*Macropygia amboinensis*	brown cuckoo-dove	C	None	0	1	20/11/2002
1793	Aves	Columbidae	*Ocyphaps lophotes*	crested pigeon	C	None	0	16	07/02/2008
1795	Aves	Columbidae	*Phaps chalcoptera*	common bronzewing	C	None	0	8	10/02/2006
1770	Aves	Columbidae	*Ptilinopus magnificus*	wompoo fruit-dove	C	None	0	1	20/11/2002
1779	Aves	Coraciidae	*Eurystomus orientalis*	dollarbird	C	None	0	13	24/12/2004
1609	Aves	Corvidae	*Corvus orru*	Torresian crow	C	None	0	39	17/10/2012
1751	Aves	Cuculidae	*Centropus phasianinus*	pheasant coucal	C	None	0	7	25/01/2006
1744	Aves	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	C	None	0	1	10/04/2001
1745	Aves	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo	C	None	0	1	20/11/2002
1738	Aves	Cuculidae	*Eudynamys orientalis*	eastern koel	C	None	0	2	24/12/2004
1740	Aves	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo	C	None	0	2	24/12/2004
1601	Aves	Dicruridae	*Dicrurus bracteatus*	spangled drongo	C	None	0	2	20/11/2002
1366	Aves	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin	C	None	0	1	31/12/1992
1369	Aves	Estrildidae	*Neochmia modesta*	plum-headed finch	C	None	0	1	10/02/2001
1342	Aves	Estrildidae	*Taeniopygia bichenovii*	double-barred finch	C	None	0	10	24/12/2004
1343	Aves	Estrildidae	*Taeniopygia guttata*	zebra finch	C	None	0	1	17/10/2012
1716	Aves	Falconidae	*Falco berigora*	brown falcon	C	None	0	5	31/12/2010
1704	Aves	Falconidae	*Falco cenchroides*	nankeen kestrel	C	None	0	13	15/08/2001
1691	Aves	Falconidae	*Falco longipennis*	Australian hobby	C	None	0	2	15/01/2000
1692	Aves	Falconidae	*Falco peregrinus*	peregrine falcon	C	None	0	2	17/10/2006
1766	Aves	Halcyonidae	*Dacelo leachii*	blue-winged kookaburra	C	None	0	5	31/12/1992
1767	Aves	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra	C	None	0	24	24/12/2004

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1760	Aves	Halcyonidae	*Todiramphus macleayii*	forest kingfisher	C	None	0	1	31/12/1999
1762	Aves	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher	C	None	0	9	25/01/2006
1572	Aves	Hirundinidae	*Hirundo neoxena*	welcome swallow	C	None	0	18	17/10/2012
1585	Aves	Hirundinidae	*Petrochelidon ariel*	fairy martin	C	None	0	4	10/02/2006
1573	Aves	Hirundinidae	*Petrochelidon nigricans*	tree martin	C	None	0	2	10/02/2001
1928	Aves	Jacanidae	*Irediparra gallinacea*	comb-crested jacana	C	None	0	2	27/07/1999
1570	Aves	Maluridae	*Malurus cyaneus*	superb fairy-wren	C	None	0	12	17/10/2012
1558	Aves	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	C	None	0	25	25/07/2003
1291	Aves	Megaluridae	*Cincloramphus cruralis*	brown songlark	C	None	0	1	12/01/1992
1292	Aves	Megaluridae	*Cincloramphus mathewsi*	rufous songlark	C	None	0	1	12/01/1992
1289	Aves	Megaluridae	*Megalurus timoriensis*	tawny grassbird	C	None	0	2	10/02/2001
1694	Aves	Megapodiidae	*Alectura lathami*	Australian brush-turkey	C	None	0	1	20/11/2002
1523	Aves	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater	C	None	0	4	20/11/2002
1539	Aves	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	C	None	0	5	20/07/2002
1497	Aves	Meliphagidae	*Lichmera indistincta*	brown honeyeater	C	None	0	6	14/05/2004
1500	Aves	Meliphagidae	*Manorina melanocephala*	noisy miner	C	None	0	24	17/10/2012
1504	Aves	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater	C	None	0	1	20/11/2002
1507	Aves	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater	C	None	0	16	14/05/2004
1485	Aves	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater	C	None	0	1	20/11/2002
1489	Aves	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater	C	None	0	3	20/07/2002
1493	Aves	Meliphagidae	*Philemon citreogularis*	little friarbird	C	None	0	9	10/02/2006
1494	Aves	Meliphagidae	*Philemon corniculatus*	noisy friarbird	C	None	0	9	25/09/2004
1471	Aves	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater	C	None	0	6	10/02/2006
1764	Aves	Meropidae	*Merops ornatus*	rainbow bee-eater	C	None	0	17	31/12/2010
1589	Aves	Monarchidae	*Grallina cyanoleuca*	magpie-lark	C	None	0	27	07/02/2008
1595	Aves	Monarchidae	*Monarcha melanopsis*	black-faced monarch	SL	None	0	1	20/11/2002
1600	Aves	Monarchidae	*Myiagra inquieta*	restless flycatcher	C	None	0	3	20/07/2002
1455	Aves	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	C	None	0	1	20/07/2002

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1611	Aves	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird	C	None	0	9	10/02/2006
1453	Aves	Neosittidae	*Daphoenositta chrysoptera*	varied sittella	C	None	0	4	20/11/2002
1442	Aves	Oriolidae	*Oriolus sagittatus*	olive-backed oriole	C	None	0	6	24/12/2004
1444	Aves	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird	C	None	0	6	20/11/2002
1447	Aves	Orthonychidae	*Orthonyx temminckii*	Australian logrunner	C	None	0	1	20/11/2002
1449	Aves	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	C	None	0	4	20/11/2002
1429	Aves	Pachycephalidae	*Falcunculus frontatus*	crested shrike-tit	C	None	0	1	20/11/2002
1436	Aves	Pachycephalidae	*Pachycephala pectoralis*	golden whistler	C	None	0	8	14/05/2004
1437	Aves	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	C	None	0	16	10/02/2006
1415	Aves	Paradisaeidae	*Ptiloris paradiseus*	paradise riflebird	C	None	0	1	20/11/2002
1389	Aves	Pardalotidae	*Pardalotus punctatus*	spotted pardalote	C	None	0	3	20/07/2002
1392	Aves	Pardalotidae	*Pardalotus striatus*	striated pardalote	C	None	0	26	25/09/2004
1284	Aves	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	C	None	0	3	08/10/2000
1347	Aves	Petroicidae	*Eopsaltria australis*	eastern yellow robin	C	None	0	2	20/11/2002
1339	Aves	Petroicidae	*Microeca fascinans*	jacky winter	C	None	0	1	20/07/2002
1329	Aves	Petroicidae	*Petroica goodenovii*	red-capped robin	C	None	0	3	10/02/2006
1332	Aves	Petroicidae	*Petroica rosea*	rose robin	C	None	0	8	10/02/2006
1321	Aves	Petroicidae	*Tregellasia capito*	pale-yellow robin	C	None	0	1	20/11/2002
1261	Aves	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant	C	None	0	4	07/04/2001
1264	Aves	Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant	C	None	0	2	06/05/2000
1687	Aves	Phasianidae	*Coturnix ypsilophora*	brown quail	C	None	0	3	16/05/2000
1326	Aves	Pittidae	*Pitta versicolor*	noisy pitta	C	None	0	1	20/11/2002
1955	Aves	Podargidae	*Podargus strigoides*	tawny frogmouth	C	None	0	5	20/07/2002
1249	Aves	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe	C	None	0	6	25/07/2003
1318	Aves	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler	C	None	0	6	25/09/2004
1180	Aves	Psittacidae	*Alisterus scapularis*	Australian king-parrot	C	None	0	4	20/11/2002
1147	Aves	Psittacidae	*Parvipsitta pusilla*	little lorikeet	C	None	0	7	14/05/2004
1136	Aves	Psittacidae	*Platycercus adscitus*	pale-headed rosella	C	None	0	25	14/05/2004

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
21976	Aves	Psittacidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)	C	None	0	2	25/09/2004
1138	Aves	Psittacidae	*Platycercus elegans*	crimson rosella	C	None	0	2	20/11/2002
1139	Aves	Psittacidae	*Platycercus eximius*	eastern rosella	C	None	0	1	31/12/1999
1124	Aves	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet	C	None	0	25	24/12/2004
1125	Aves	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet	C	None	0	11	20/11/2002
1623	Aves	Psophodidae	*Psophodes olivaceus*	eastern whipbird	C	None	0	3	20/11/2002
1177	Aves	Ptilonorhynchidae	*Ailuroedus crassirostris*	green catbird	C	None	0	1	20/11/2002
1320	Aves	Ptilonorhynchidae	*Ptilonorhynchus violaceus*	satin bowerbird	C	None	0	1	20/11/2002
1308	Aves	Ptilonorhynchidae	*Sericulus chrysocephalus*	regent bowerbird	C	None	0	1	20/11/2002
1686	Aves	Rallidae	*Fulica atra*	Eurasian coot	C	None	0	3	06/05/2000
1673	Aves	Rallidae	*Gallinula tenebrosa*	dusky moorhen	C	None	0	5	17/10/2012
1675	Aves	Rallidae	*Gallirallus philippensis*	buff-banded rail	C	None	0	1	31/12/1999
1662	Aves	Rallidae	*Porphyrio melanotus*	purple swamphen	C	None	0	5	02/04/2001
1893	Aves	Recurvirostridae	*Himantopus himantopus*	black-winged stilt	C	None	0	3	06/05/2000
1575	Aves	Rhipiduridae	*Rhipidura albiscapa*	grey fantail	C	None	0	16	14/05/2004
1576	Aves	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail	C	None	0	33	24/12/2004
1578	Aves	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail	SL	None	0	1	20/11/2002
1879	Aves	Scolopacidae	*Calidris melanotos*	pectoral sandpiper	SL	None	0	1	16/11/1980
1843	Aves	Scolopacidae	*Numenius madagascariensis*	eastern curlew	E	CE	0	1	18/07/1999
1102	Aves	Strigidae	*Ninox boobook*	southern boobook	C	None	0	3	20/11/2002
1107	Aves	Strigidae	*Ninox strenua*	powerful owl	V	None	0	1	31/12/2010
1314	Aves	Sturnidae	*Acridotheres tristis*	common myna	None	None	0	8	15/10/2001
1303	Aves	Sturnidae	*Sturnus vulgaris*	common starling	None	None	0	6	10/02/2001
1822	Aves	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill	C	None	0	2	27/07/1999
1823	Aves	Threskiornithidae	*Platalea regia*	royal spoonbill	C	None	0	2	27/07/1999
1825	Aves	Threskiornithidae	*Plegadis falcinellus*	glossy ibis	SL	None	0	1	27/07/1999
1812	Aves	Threskiornithidae	*Threskiornis molucca*	Australian white ibis	C	None	0	5	07/02/2008
1800	Aves	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis	C	None	0	12	07/02/2008

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1276	Aves	Timaliidae	*Zosterops lateralis*	silvereye	C	None	0	12	10/02/2006
1463	Aves	Turdidae	*Zoothera heinei*	russet-tailed thrush	C	None	0	1	20/11/2002
1108	Aves	Tytonidae	*Tyto delicatula*	eastern barn owl	C	None	0	1	18/07/1992
1084	Mammalia	Bovidae	*Bos taurus*	European cattle	None	None	0	1	31/12/1999
1067	Mammalia	Canidae	*Canis familiaris*	dog	None	None	0	1	31/12/1999
1071	Mammalia	Canidae	*Vulpes vulpes*	red fox	None	None	0	2	18/05/2001
803	Mammalia	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)	V	E	0	1	31/12/2009
808	Mammalia	Dasyuridae	*Phascogale tapoatafa tapoatafa*	brush-tailed phascogale	C	None	0	1	18/05/2018
811	Mammalia	Dasyuridae	*Planigale maculata*	common planigale	C	None	0	1	31/12/1999
793	Mammalia	Dasyuridae	*Sminthopsis murina*	common dunnart	C	None	0	2	31/12/2010
832	Mammalia	Leporidae	*Lepus europaeus*	European brown hare	None	None	0	3	31/12/1999
901	Mammalia	Macropodidae	*Macropus giganteus*	eastern grey kangaroo	C	None	0	3	25/09/2004
904	Mammalia	Macropodidae	*Macropus rufogriseus*	red-necked wallaby	C	None	0	3	24/03/2001
890	Mammalia	Macropodidae	*Petrogale penicillata*	brush-tailed rock-wallaby	V	V	0	1	31/12/1993
885	Mammalia	Macropodidae	*Wallabia bicolor*	swamp wallaby	C	None	0	1	17/10/2012
731	Mammalia	Muridae	*Rattus rattus*	black rat	None	None	0	2	10/02/2006
784	Mammalia	Peramelidae	*Isoodon macrourus*	northern brown bandicoot	C	None	0	1	31/12/1992
877	Mammalia	Petauridae	*Petaurus breviceps*	sugar glider	C	None	0	4	31/12/2010
879	Mammalia	Petauridae	*Petaurus norfolcensis*	squirrel glider	C	None	0	4	31/12/2010
859	Mammalia	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum	C	None	0	2	24/03/2001
860	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	V	V	0	942	01/01/2012
2455	Mammalia	Pseudocheiridae	*Petauroides volans volans*	southern greater glider	V	V	0	1	31/12/1999
838	Mammalia	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	None	0	1	31/12/1999
554	Reptilia	Agamidae	*Intellagama lesueurii*	eastern water dragon	C	None	0	2	17/10/2012
556	Reptilia	Agamidae	*Pogona barbata*	bearded dragon	C	None	0	4	31/03/2015
63	Reptilia	Chelidae	*Chelodina longicollis*	eastern snake-necked turtle	C	None	0	1	31/12/1999
512	Reptilia	Colubridae	*Dendrelaphis punctulatus*	green tree snake	C	None	0	1	31/12/1999
391	Reptilia	Diplodactylidae	*Nebulifera robusta*	robust velvet gecko	C	None	0	1	31/12/1999

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
457	Reptilia	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake	C	None	0	1	31/12/1999
479	Reptilia	Elapidae	*Hoplocephalus bitorquatus*	pale-headed snake	C	None	1	1	31/12/1996
462	Reptilia	Elapidae	*Pseudechis porphyriacus*	red-bellied black snake	C	None	0	4	24/03/2015
454	Reptilia	Elapidae	*Pseudonaja textilis*	eastern brown snake	C	None	0	1	31/12/1999
420	Reptilia	Gekkonidae	*Gehyra dubia*	dubious dtella	C	None	0	1	31/12/1999
321	Reptilia	Pygopodidae	*Delma plebeia*	common delma	C	None	0	6	31/03/2015
308	Reptilia	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink	C	None	0	1	31/12/1999
34646	Reptilia	Scincidae	*Carlia pectoralis*	open-litter rainbow skink	C	None	0	2	31/03/2015
277	Reptilia	Scincidae	*Carlia vivax*	tussock rainbow-skink	C	None	0	1	31/12/1999
31898	Reptilia	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink	C	None	0	1	31/12/1999
240	Reptilia	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus	C	None	0	1	31/12/1999
184	Reptilia	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink	C	None	0	2	24/03/2015
83	Reptilia	Typhlopidae	*Anilios wiedii*	brown-snouted blind snake	C	None	0	1	31/12/1999

Table 3. Plants recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
17767	Equisetopsida	Acanthaceae	*Brunoniella australis*	blue trumpet	C	None	0	1	20/04/2001
13379	Equisetopsida	Alismataceae	*Damasonium minus*	starfruit	C	None	2	2	16/04/1991
18101	Equisetopsida	Amaranthaceae	*Achyranthes aspera*	None	C	None	0	1	20/04/2001
18026	Equisetopsida	Amaranthaceae	*Alternanthera denticulata*	lesser joyweed	C	None	1	1	16/04/1991
32727	Equisetopsida	Amaranthaceae	*Alternanthera denticulata var. micrantha*	None	C	None	1	1	29/04/1990
17051	Equisetopsida	Amaranthaceae	*Gomphrena celosioides*	gomphrena weed	None	None	0	1	20/04/2001
11782	Equisetopsida	Amaranthaceae	*Guilleminea densa*	small matweed	None	None	1	1	07/03/2001
15545	Equisetopsida	Apiaceae	*Centella asiatica*	None	C	None	0	1	20/04/2001
9484	Equisetopsida	Apocynaceae	*Alstonia constricta*	bitterbark	C	None	0	1	20/04/2001
17050	Equisetopsida	Apocynaceae	*Gomphocarpus physocarpus*	balloon cottonbush	None	None	1	2	20/04/2001
11205	Equisetopsida	Apocynaceae	*Marsdenia coronata*	slender milkvine	V	None	1	2	13/02/2017
16526	Equisetopsida	Apocynaceae	*Parsonsia straminea*	monkey rope	C	None	0	1	20/04/2001
15835	Equisetopsida	Asteraceae	*Acmella grandiflora var. brachyglossa*	None	C	None	1	2	18/02/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
22801	Equisetopsida	Asteraceae	*Ageratum conyzoides subsp. conyzoides*	None	None	None	1	1	08/05/1962
35061	Equisetopsida	Asteraceae	*Apowollastonia spilanthoides*	None	C	None	0	1	20/04/2001
15612	Equisetopsida	Asteraceae	*Baccharis halimifolia*	groundsel bush	None	None	0	2	07/07/2014
15572	Equisetopsida	Asteraceae	*Camptacra barbata*	None	C	None	1	2	27/11/2015
14738	Equisetopsida	Asteraceae	*Cassinia laevis*	None	C	None	0	1	20/04/2001
15546	Equisetopsida	Asteraceae	*Centipeda minima subsp. minima*	None	C	None	1	1	16/04/1991
8398	Equisetopsida	Asteraceae	*Chrysocephalum apiculatum*	yellow buttons	C	None	1	2	20/04/2001
14001	Equisetopsida	Asteraceae	*Cirsium vulgare*	spear thistle	None	None	0	2	17/10/2012
22237	Equisetopsida	Asteraceae	*Cyanthillium cinereum*	None	C	None	0	2	20/04/2001
11069	Equisetopsida	Asteraceae	*Eclipta platyglossa*	None	C	None	0	1	20/04/2001
34823	Equisetopsida	Asteraceae	*Eclipta platyglossa subsp. platyglossa*	None	C	None	2	2	16/04/1991
35896	Equisetopsida	Asteraceae	*Erigeron bonariensis*	None	None	None	0	1	20/04/2001
8401	Equisetopsida	Asteraceae	*Euchiton sphaericus*	None	C	None	1	1	01/12/2015
9092	Equisetopsida	Asteraceae	*Glossocardia bidens*	native cobbler's pegs	C	None	0	1	20/04/2001
36072	Equisetopsida	Asteraceae	*Lagenophora fimbriata*	None	C	None	5	5	01/12/2015
15269	Equisetopsida	Asteraceae	*Lagenophora gracilis*	None	C	None	0	1	20/04/2001
8366	Equisetopsida	Asteraceae	*Ozothamnus diosmifolius*	white dogwood	C	None	0	1	20/04/2001
10486	Equisetopsida	Asteraceae	*Senecio madagascariensis*	fireweed	None	None	1	2	12/08/2017
10442	Equisetopsida	Asteraceae	*Solenogyne bellioides*	None	C	None	1	1	01/12/2015
14957	Equisetopsida	Asteraceae	*Vittadinia dissecta var. hirta*	None	C	None	0	1	20/04/2001
14959	Equisetopsida	Asteraceae	*Vittadinia sulcata*	native daisy	C	None	1	1	07/12/2006
22235	Equisetopsida	Asteraceae	*Xanthium occidentale*	None	None	None	0	1	20/04/2001
16570	Equisetopsida	Bignoniaceae	*Pandorea pandorana*	wonga vine	C	None	0	2	20/04/2001
10854	Equisetopsida	Brassicaceae	*Lepidium africanum*	common peppercress	None	None	1	1	01/12/2015
26204	Equisetopsida	Bryaceae	*Rosulabryum subfasciculatum*	None	C	None	1	1	13/10/2015
19352	Equisetopsida	Cactaceae	*Opuntia stricta*	None	None	None	0	1	04/07/2014
9535	Equisetopsida	Cactaceae	*Opuntia tomentosa*	velvety tree pear	None	None	0	3	04/07/2014
15614	Equisetopsida	Caesalpiniaceae	*Barklya syringifolia*	golden shower tree	C	None	1	1	12/12/1987
33856	Equisetopsida	Campanulaceae	*Lobelia concolor*	None	C	None	0	1	20/04/2001
16766	Equisetopsida	Campanulaceae	*Lobelia purpurascens*	white root	C	None	0	1	20/04/2001
13864	Equisetopsida	Campanulaceae	*Lobelia stenophylla*	None	C	None	2	2	16/04/1991
36488	Equisetopsida	Campanulaceae	*Wahlenbergia capillaris*	None	C	None	0	1	20/04/2001

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
15918	Equisetopsida	Campanulaceae	*Wahlenbergia gracilis*	sprawling bluebell	C	None	0	1	20/04/2001
18013	Equisetopsida	Casuarinaceae	*Allocasuarina luehmannii*	bull oak	C	None	0	2	07/07/2014
33690	Equisetopsida	Chenopodiaceae	*Dysphania multifida*	None	None	None	1	1	23/01/2018
17320	Equisetopsida	Chenopodiaceae	*Einadia polygonoides*	knotweed goosefoot	C	None	1	1	16/04/1991
14431	Equisetopsida	Chenopodiaceae	*Maireana microphylla*	None	C	None	0	1	20/04/2001
34403	Equisetopsida	Clusiaceae	*Hypericum involutum*	None	C	None	1	1	16/04/1991
10033	Equisetopsida	Commelinaceae	*Commelina diffusa*	wandering jew	C	None	0	2	24/12/2004
16599	Equisetopsida	Commelinaceae	*Murdannia graminea*	murdannia	C	None	0	1	24/12/2004
17422	Equisetopsida	Convolvulaceae	*Dichondra repens*	kidney weed	C	None	0	1	20/04/2001
17176	Equisetopsida	Convolvulaceae	*Evolvulus alsinoides*	None	C	None	0	1	20/04/2001
21934	Equisetopsida	Crassulaceae	*Bryophyllum delagoense*	None	None	None	1	2	18/02/2014
14785	Equisetopsida	Cyperaceae	*Bolboschoenus fluviatilis*	None	C	None	0	1	20/04/2001
17686	Equisetopsida	Cyperaceae	*Carex appressa*	None	C	None	0	1	20/04/2001
14779	Equisetopsida	Cyperaceae	*Carex inversa*	knob sedge	C	None	2	2	18/02/2015
14662	Equisetopsida	Cyperaceae	*Cyperus eragrostis*	None	None	None	0	1	17/10/2012
13966	Equisetopsida	Cyperaceae	*Cyperus flaccidus*	None	C	None	1	1	16/04/1991
10924	Equisetopsida	Cyperaceae	*Cyperus mirus*	None	C	None	1	1	18/02/2015
11453	Equisetopsida	Cyperaceae	*Cyperus platystylis*	None	C	None	1	1	20/02/2013
17475	Equisetopsida	Cyperaceae	*Cyperus polystachyos var. polystachyos*	None	C	None	0	1	17/10/2012
14667	Equisetopsida	Cyperaceae	*Cyperus scariosus*	None	C	None	0	1	20/04/2001
10327	Equisetopsida	Cyperaceae	*Cyperus sculptus*	None	C	None	3	3	16/04/2006
11954	Equisetopsida	Cyperaceae	*Cyperus sesquiflorus*	None	None	None	1	1	16/04/1991
17485	Equisetopsida	Cyperaceae	*Cyperus trinervis*	None	C	None	1	1	16/04/1991
17340	Equisetopsida	Cyperaceae	*Eleocharis cylindrostachys*	None	C	None	1	1	12/04/1930
9816	Equisetopsida	Cyperaceae	*Eleocharis dietrichiana*	None	C	None	1	1	20/02/2013
11072	Equisetopsida	Cyperaceae	*Eleocharis philippinensis*	None	C	None	1	1	16/04/1991
17107	Equisetopsida	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush	C	None	0	1	20/04/2001
17108	Equisetopsida	Cyperaceae	*Fimbristylis ferruginea*	None	C	None	0	1	20/04/2001
34090	Equisetopsida	Cyperaceae	*Schoenoplectus subulatus*	None	C	None	0	1	17/10/2012
14577	Equisetopsida	Elatinaceae	*Elatine gratioloides*	waterwort	C	None	0	1	17/10/2012
24665	Equisetopsida	Entodontaceae	*Entodon mackaviensis*	None	C	None	1	1	07/09/2011
13642	Equisetopsida	Fabaceae	*Desmodium brachypodum*	large ticktrefoil	C	None	1	1	18/02/2015

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
15460	Equisetopsida	Fabaceae	*Desmodium rhytidophyllum*	None	C	None	0	1	20/04/2001
15356	Equisetopsida	Fabaceae	*Glycine tabacina*	glycine pea	C	None	1	1	29/04/1990
15309	Equisetopsida	Fabaceae	*Hardenbergia violacea*	None	C	None	0	1	20/04/2001
15296	Equisetopsida	Fabaceae	*Indigofera linnaei*	Birdsville indigo	C	None	0	1	20/04/2001
15260	Equisetopsida	Fabaceae	*Jacksonia scoparia*	None	C	None	0	1	20/04/2001
11444	Equisetopsida	Fabaceae	*Lablab purpureus*	lablab	None	None	1	1	08/06/1995
19911	Equisetopsida	Fabaceae	*Lespedeza juncea*	None	C	None	0	1	20/04/2001
14426	Equisetopsida	Fabaceae	*Macroptilium lathyroides*	None	None	None	0	1	20/04/2001
14918	Equisetopsida	Fabaceae	*Zornia dyctiocarpa var. dyctiocarpa*	None	C	None	1	1	16/04/1991
24712	Equisetopsida	Funariaceae	*Funaria hygrometrica*	None	C	None	1	1	07/09/2011
11010	Equisetopsida	Goodeniaceae	*Goodenia gracilis*	None	C	None	3	3	27/11/2015
9253	Equisetopsida	Goodeniaceae	*Goodenia hederacea*	None	C	None	0	1	20/04/2001
11360	Equisetopsida	Goodeniaceae	*Velleia paradoxa*	spur velleia	C	None	2	2	16/04/1991
13239	Equisetopsida	Hemerocallidaceae	*Dianella brevipedunculata*	None	C	None	1	2	07/12/2006
12843	Equisetopsida	Hemerocallidaceae	*Dianella rara*	None	C	None	1	1	01/12/2015
14594	Equisetopsida	Hemerocallidaceae	*Dianella revoluta*	None	C	None	0	1	20/04/2001
15350	Equisetopsida	Hemerocallidaceae	*Geitonoplesium cymosum*	scrambling lily	C	None	0	1	20/04/2001
15286	Equisetopsida	Hypoxidaceae	*Hypoxis pratensis var. pratensis*	None	C	None	1	1	29/04/1990
15974	Equisetopsida	Johnsoniaceae	*Tricoryne elatior*	yellow autumn lily	C	None	0	1	24/12/2004
13895	Equisetopsida	Juncaceae	*Juncus polyanthemus*	None	C	None	1	3	20/02/2013
16846	Equisetopsida	Juncaceae	*Juncus usitatus*	None	C	None	1	2	20/04/2001
15243	Equisetopsida	Lamiaceae	*Mentha satureioides*	native pennyroyal	C	None	0	1	20/04/2001
15339	Equisetopsida	Laxmanniaceae	*Eustrephus latifolius*	wombat berry	C	None	0	1	20/04/2001
12409	Equisetopsida	Laxmanniaceae	*Lomandra*	None	None	None	0	1	17/10/2012
16771	Equisetopsida	Laxmanniaceae	*Lomandra filiformis*	None	C	None	1	1	01/12/2015
16770	Equisetopsida	Laxmanniaceae	*Lomandra filiformis subsp. filiformis*	None	C	None	2	2	18/02/2015
16777	Equisetopsida	Laxmanniaceae	*Lomandra multiflora subsp. multiflora*	None	C	None	0	1	20/04/2001
14166	Equisetopsida	Lentibulariaceae	*Utricularia aurea*	golden bladderwort	C	None	1	1	04/04/1991
9417	Equisetopsida	Lentibulariaceae	*Utricularia gibba*	floating bladderwort	C	None	1	1	20/02/2013
36239	Equisetopsida	Linderniaceae	*Lindernia procumbens*	None	C	None	1	1	16/04/1991
11979	Equisetopsida	Lythraceae	*Ammannia multiflora*	jerry-jerry	C	None	1	1	16/04/1991

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
22197	Equisetopsida	Malvaceae	*Sida hackettiana*	None	C	None	0	1	20/04/2001
16146	Equisetopsida	Malvaceae	*Sida rhombifolia*	None	None	None	0	1	20/04/2001
12358	Equisetopsida	Marsileaceae	*Marsilea mutica*	shiny nardoo	C	None	0	1	20/04/2001
14327	Equisetopsida	Menyanthaceae	*Nymphoides indica*	water snowflake	C	None	0	1	20/04/2001
15827	Equisetopsida	Mimosaceae	*Acacia aulacocarpa*	None	C	None	0	1	20/04/2001
15790	Equisetopsida	Mimosaceae	*Acacia concurrens*	None	C	None	0	1	20/04/2001
21915	Equisetopsida	Mimosaceae	*Acacia disparrima subsp. disparrima*	None	C	None	0	5	07/07/2014
15799	Equisetopsida	Mimosaceae	*Acacia falcata*	sickle wattle	C	None	0	1	20/04/2001
15772	Equisetopsida	Mimosaceae	*Acacia maidenii*	Maiden's wattle	C	None	0	1	20/04/2001
15694	Equisetopsida	Mimosaceae	*Acacia salicina*	doolan	C	None	0	1	07/07/2014
14370	Equisetopsida	Mimosaceae	*Neptunia gracilis forma gracilis*	None	C	None	0	1	20/04/2001
17143	Equisetopsida	Moraceae	*Ficus obliqua*	None	C	None	0	1	20/04/2001
17999	Equisetopsida	Myrtaceae	*Angophora leiocarpa*	rusty gum	C	None	0	1	20/04/2001
26382	Equisetopsida	Myrtaceae	*Corymbia citriodora subsp. variegata*	None	C	None	0	21	04/11/2014
6534	Equisetopsida	Myrtaceae	*Corymbia clarksoniana*	None	C	None	0	1	20/04/2001
6572	Equisetopsida	Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash	C	None	0	9	07/07/2014
17252	Equisetopsida	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark	C	None	2	25	07/07/2014
17221	Equisetopsida	Myrtaceae	*Eucalyptus melanophloia*	None	C	None	0	1	20/04/2001
34185	Equisetopsida	Myrtaceae	*Eucalyptus melanophloia subsp. melanophloia*	None	C	None	0	5	07/07/2014
17229	Equisetopsida	Myrtaceae	*Eucalyptus moluccana*	gum-topped box	C	None	0	1	04/11/2014
12465	Equisetopsida	Myrtaceae	*Eucalyptus siderophloia*	None	C	None	0	1	04/11/2014
17204	Equisetopsida	Myrtaceae	*Eucalyptus tereticornis*	None	C	None	0	2	17/10/2012
16730	Equisetopsida	Myrtaceae	*Lophostemon suaveolens*	swamp box	C	None	0	1	20/04/2001
26403	Equisetopsida	Myrtaceae	*Melaleuca irbyana*	None	E	None	8	11	17/12/2018
31375	Equisetopsida	Myrtaceae	*Melaleuca viminalis*	None	C	None	0	1	17/10/2012
15857	Equisetopsida	Myrtaceae	*Waterhousea floribunda*	weeping lilly pilly	C	None	0	1	17/10/2012
6877	Equisetopsida	Nyctaginaceae	*Boerhavia sp. (St George A.Hill AQ399299)*	None	C	None	1	1	06/02/1972
29765	Equisetopsida	Nymphaeaceae	*Nymphaea gigantea*	None	C	None	2	2	01/04/2010
33129	Equisetopsida	Oleaceae	*Jasminum dianthifolium*	None	C	None	1	2	18/02/2015
9680	Equisetopsida	Oleaceae	*Notelaea lloydii*	Lloyd's native olive	V	V	1	1	06/06/2018

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
13420	Equisetopsida	Onagraceae	*Ludwigia octovalvis*	willow primrose	C	None	0	1	20/04/2001
16731	Equisetopsida	Onagraceae	*Ludwigia peploides subsp. montevidensis*	None	C	None	0	1	20/04/2001
5779	Equisetopsida	Orchidaceae	*Dockrillia linguiformis*	tongue orchid	C	None	0	1	20/04/2001
9457	Equisetopsida	Oxalidaceae	*Oxalis corniculata*	None	None	None	0	1	20/04/2001
12740	Equisetopsida	Oxalidaceae	*Oxalis perennans*	None	C	None	1	1	16/04/1991
36076	Equisetopsida	Passifloraceae	*Passiflora pallida*	None	None	None	1	1	12/08/2017
16532	Equisetopsida	Passifloraceae	*Passiflora suberosa*	corky passion flower	None	None	0	1	20/04/2001
16660	Equisetopsida	Pentapetaceae	*Melhania oblongifolia*	None	C	None	1	1	22/03/2010
16473	Equisetopsida	Phyllanthaceae	*Phyllanthus virgatus*	None	C	None	0	1	20/04/2001
16505	Equisetopsida	Picrodendraceae	*Petalostigma pubescens*	quinine tree	C	None	0	1	20/04/2001
14824	Equisetopsida	Plantaginaceae	*Bacopa floribunda*	None	C	None	1	1	16/04/1991
12727	Equisetopsida	Plantaginaceae	*Plantago debilis*	shade plantain	C	None	2	2	18/02/2015
15670	Equisetopsida	Poaceae	*Alloteropsis semialata*	cockatoo grass	C	None	1	1	09/09/1985
11121	Equisetopsida	Poaceae	*Aristida gracilipes*	None	C	None	0	1	20/04/2001
9973	Equisetopsida	Poaceae	*Axonopus fissifolius*	None	None	None	0	1	20/04/2001
15604	Equisetopsida	Poaceae	*Bothriochloa bladhii subsp. bladhii*	None	C	None	2	2	16/04/1991
10316	Equisetopsida	Poaceae	*Bothriochloa decipiens var. decipiens*	None	C	None	0	1	20/04/2001
14774	Equisetopsida	Poaceae	*Capillipedium spicigerum*	spicytop	C	None	0	1	20/04/2001
15550	Equisetopsida	Poaceae	*Chloris divaricata var. divaricata*	slender chloris	C	None	0	1	20/04/2001
15551	Equisetopsida	Poaceae	*Chloris gayana*	rhodes grass	None	None	0	1	20/04/2001
14753	Equisetopsida	Poaceae	*Chloris truncata*	None	C	None	0	1	20/04/2001
11103	Equisetopsida	Poaceae	*Chrysopogon sylvaticus*	None	C	None	0	1	20/04/2001
15485	Equisetopsida	Poaceae	*Cymbopogon refractus*	barbed-wire grass	C	None	0	1	20/04/2001
15486	Equisetopsida	Poaceae	*Cynodon dactylon*	None	None	None	0	1	20/04/2001
15467	Equisetopsida	Poaceae	*Dichanthium sericeum subsp. sericeum*	None	C	None	1	1	12/04/1930
10401	Equisetopsida	Poaceae	*Dichanthium setosum*	None	C	V	1	1	05/04/2018
15420	Equisetopsida	Poaceae	*Digitaria ciliaris*	summer grass	None	None	1	1	12/04/1930
34493	Equisetopsida	Poaceae	*Dinebra decipiens var. decipiens*	None	C	None	1	1	18/02/2015
14567	Equisetopsida	Poaceae	*Echinochloa colona*	awnless barnyard grass	None	None	2	2	12/04/1930
15409	Equisetopsida	Poaceae	*Enteropogon unispiceus*	None	C	None	0	1	20/04/2001
15390	Equisetopsida	Poaceae	*Eragrostis brownii*	Brown's lovegrass	C	None	0	1	20/04/2001
15361	Equisetopsida	Poaceae	*Eragrostis elongata*	None	C	None	1	1	16/04/1991
15380	Equisetopsida	Poaceae	*Eremochloa bimaculata*	poverty grass	C	None	0	1	20/04/2001

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
15331	Equisetopsida	Poaceae	*Eriochloa procera*	slender cupgrass	C	None	1	1	12/04/1930
15320	Equisetopsida	Poaceae	*Heteropogon contortus*	black speargrass	C	None	1	2	20/04/2001
15290	Equisetopsida	Poaceae	*Imperata cylindrica*	blady grass	C	None	0	1	20/04/2001
14437	Equisetopsida	Poaceae	*Leersia hexandra*	swamp rice grass	C	None	1	1	12/04/1930
29093	Equisetopsida	Poaceae	*Megathyrsus maximus*	None	None	None	0	1	17/10/2012
27900	Equisetopsida	Poaceae	*Megathyrsus maximus var. pubiglumis*	None	None	None	0	1	20/04/2001
9154	Equisetopsida	Poaceae	*Melinis repens*	red natal grass	None	None	0	1	20/04/2001
9599	Equisetopsida	Poaceae	*Panicum decompositum*	None	C	None	0	1	20/04/2001
15173	Equisetopsida	Poaceae	*Panicum decompositum var. decompositum*	None	C	None	1	1	12/04/1930
13607	Equisetopsida	Poaceae	*Panicum effusum*	None	C	None	0	1	20/04/2001
18424	Equisetopsida	Poaceae	*Panicum simile*	None	C	None	1	1	12/04/1930
15184	Equisetopsida	Poaceae	*Paspalidium caespitosum*	brigalow grass	C	None	1	1	18/02/2015
14345	Equisetopsida	Poaceae	*Paspalidium distans*	shotgrass	C	None	0	1	20/04/2001
15134	Equisetopsida	Poaceae	*Paspalum dilatatum*	paspalum	None	None	0	1	20/04/2001
10818	Equisetopsida	Poaceae	*Paspalum distichum*	water couch	None	None	0	1	20/04/2001
15001	Equisetopsida	Poaceae	*Sporobolus creber*	None	C	None	1	1	12/04/1930
14974	Equisetopsida	Poaceae	*Themeda triandra*	kangaroo grass	C	None	1	3	17/10/2012
11356	Equisetopsida	Poaceae	*Tragus australianus*	small burr grass	C	None	1	1	12/04/1930
13155	Equisetopsida	Polygonaceae	*Persicaria decipiens*	slender knotweed	C	None	1	1	20/02/2013
17370	Equisetopsida	Pontederiaceae	*Eichhornia crassipes*	water hyacinth	None	None	1	2	20/02/2013
17793	Equisetopsida	Portulacaceae	*Calandrinia pickeringii*	None	C	None	1	1	16/04/1991
19434	Equisetopsida	Portulacaceae	*Portulaca pilosa*	None	None	None	0	1	20/04/2001
8916	Equisetopsida	Pteridaceae	*Cheilanthes sieberi*	None	C	None	0	1	20/04/2001
9659	Equisetopsida	Rhamnaceae	*Alphitonia excelsa*	soap tree	C	None	0	3	07/07/2014
8448	Equisetopsida	Rubiaceae	*Oldenlandia galioides*	None	C	None	1	1	16/04/1991
8388	Equisetopsida	Rubiaceae	*Oldenlandia subulata*	None	C	None	1	1	29/04/1990
16139	Equisetopsida	Rubiaceae	*Spermacoce multicaulis*	None	C	None	0	1	20/04/2001
18226	Equisetopsida	Rutaceae	*Citrus x limon*	None	None	None	0	1	20/04/2001
27796	Equisetopsida	Rutaceae	*Coatesia paniculata*	None	C	None	1	1	07/11/2000
13349	Equisetopsida	Rutaceae	*Flindersia collina*	broad-leaved leopard tree	C	None	0	1	20/04/2001
17180	Equisetopsida	Santalaceae	*Exocarpos cupressiformis*	native cherry	C	None	0	1	20/04/2001
5210	Equisetopsida	Sapotaceae	*Planchonella eerwah*	None	E	E	3	3	12/12/1987
8631	Equisetopsida	Scrophulariaceae	*Eremophila debilis*	winter apple	C	None	0	1	20/04/2001

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26202	Equisetopsida	Sematophyllaceae	*Sematophyllum subhumile*	None	C	None	1	1	07/09/2011
29813	Equisetopsida	Solanaceae	*Solanum jucundum*	None	C	None	1	1	08/07/2015
13788	Equisetopsida	Solanaceae	*Solanum nigrum*	None	None	None	0	1	20/04/2001
34650	Equisetopsida	Solanaceae	*Solanum viarum*	None	None	None	1	1	10/09/2012
12554	Equisetopsida	Stackhousiaceae	*Stackhousia muricata*	None	C	None	0	1	20/04/2001
15989	Equisetopsida	Typhaceae	*Typha orientalis*	broad-leaved cumbungi	C	None	0	1	20/04/2001
34284	Equisetopsida	Verbenaceae	*Glandularia aristigera*	None	None	None	0	1	20/04/2001
19905	Equisetopsida	Verbenaceae	*Lantana camara*	lantana	None	None	0	4	04/07/2014
13853	Equisetopsida	Verbenaceae	*Lantana montevidensis*	creeping lantana	None	None	0	14	04/07/2014
7796	Equisetopsida	Verbenaceae	*Phyla canescens*	None	None	None	1	1	28/02/2013
27944	Equisetopsida	Verbenaceae	*Verbena litoralis var. litoralis*	None	None	None	1	1	12/04/1930
30780	Equisetopsida	Verbenaceae	*Verbena rigida*	None	None	None	0	1	20/04/2001
36152	Equisetopsida	Violaceae	*Afrohybanthus stellarioides*	None	C	None	0	2	24/12/2004
14132	Equisetopsida	Viscaceae	*Notothixos incanus*	None	C	None	1	2	23/09/2007

Table 4. Fungi recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
28022	Agaricomycetes	Agaricaceae	*Bovista cunninghamii*	None	C	None	1	1	09/02/2016
25531	Agaricomycetes	Amanitaceae	*Amanita*	None	None	None	1	1	06/03/2012
25511	Agaricomycetes	Amanitaceae	*Amanita vaginata*	None	C	None	1	1	08/03/2012
34600	Agaricomycetes	Sclerodermataceae	*Pisolithus marmoratus*	None	C	None	1	1	15/06/2015
28204	Dacrymycetes	Dacrymycetaceae	*Dacryopinax spathularia*	None	C	None	1	1	10/03/2016
23096	Lecanoromycetes	Caliciaceae	*Dirinaria applanata*	None	C	None	1	1	22/06/2016
34907	Lecanoromycetes	Cladoniaceae	*Cladia muelleri*	None	C	None	1	1	22/06/2016
23027	Lecanoromycetes	Cladoniaceae	*Cladonia floerkeana*	None	C	None	2	2	22/06/2016
23778	Lecanoromycetes	Cladoniaceae	*Thysanotheciu m scutellatum*	None	C	None	1	1	10/04/2014
23370	Lecanoromycetes	Parmeliaceae	*Parmotrema crinitum*	None	C	None	1	1	22/02/2016
23448	Lecanoromycetes	Parmeliaceae	*Parmotrema tinctorum*	None	C	None	1	1	22/06/2016

Table 5. Protists recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Endangered (E), Extinct in the Wild (PE), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern(C)).

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V)).

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including species information approved for publication, and generate reports
- Qld wildlife data API - access species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access species profiles
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Other useful sites for accessing biodiversity data include:

- Queensland Government Data
- Atlas of Living Australia
- OZCAM - Online Zoological Collections of Australian Museums
- AVH - Australia's Virtual Herbarium
- Protected Matters Search Tool

Please direct queries about this report to the WildNet Team.

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WildNet Records
Conservation Significant Species List

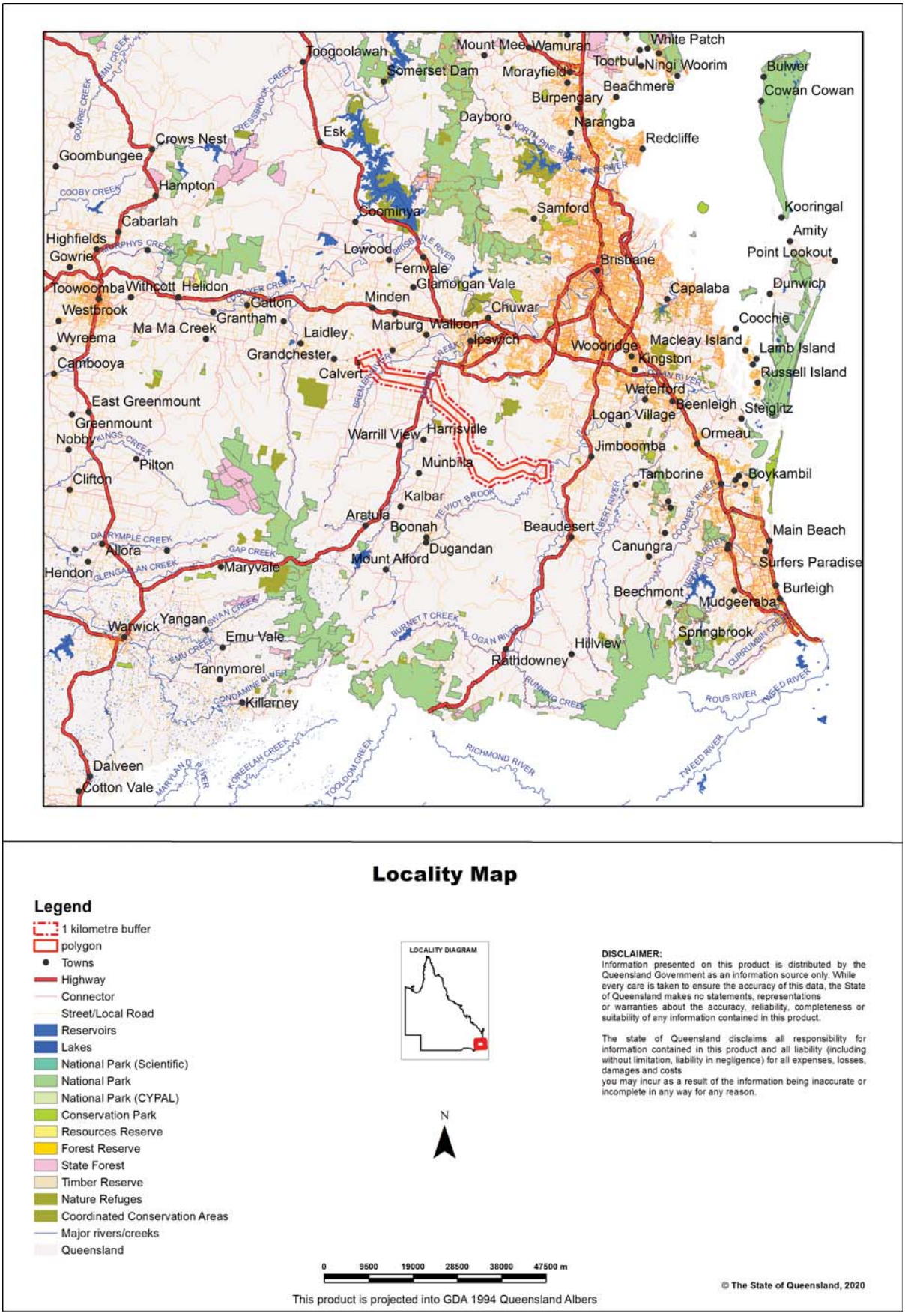
For the selected area of interest 11221.47ha

Current as at 06/02/2020

WildNetCSspecieslist

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest .

Table 1. Area of interest details

Size (ha)	11,221.47
Local Government(s)	Scenic Rim Regional, Logan City, Ipswich City
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Logan-Albert, Brisbane

Protected Area(s)
No estates or reserves are located within the area of interest.

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Conservation Significant Species List

Introduction
This Conservation Significant Species List report is derived only from records from the WildNet database managed by the Department of Environment and Science. Other data sources may provide additional information on species occurrence.

Conservation significant species are species listed:

- as threatened or near threatened under the Nature Conservation Act 1992;
- as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* or
- migratory species protected under the following international agreements:
  - Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
  - China-Australia Migratory Bird Agreement
  - Japan-Australia Migratory Bird Agreement
  - Republic of Korea-Australia Migratory Bird Agreement

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species does not occur in the report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area.

Table 2 lists the species recorded within the area of interest and its one kilometre buffer.

Table 2. Conservation significant species recorded within the area of interest and its one kilometre buffer

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1971	Animalia	Aves	Apodidae	*Hirundapus caudacutus*	white-throated needletail	V	V	0	1	20/11/2002
1595	Animalia	Aves	Monarchidae	*Monarcha melanopsis*	black-faced monarch	SL	None	0	1	20/11/2002
1578	Animalia	Aves	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail	SL	None	0	1	20/11/2002
1879	Animalia	Aves	Scolopacidae	*Calidris melanotos*	pectoral sandpiper	SL	None	0	1	16/11/1980

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1843	Animalia	Aves	Scolopacidae	*Numenius madagascariensis*	eastern curlew	E	CE	0	1	18/07/1999
1107	Animalia	Aves	Strigidae	*Ninox strenua*	powerful owl	V	None	0	1	31/12/2010
1825	Animalia	Aves	Threskiornithidae	*Plegadis falcinellus*	glossy ibis	SL	None	0	1	27/07/1999
803	Animalia	Mammalia	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)	V	E	0	1	31/12/2009
890	Animalia	Mammalia	Macropodidae	*Petrogale penicillata*	brush-tailed rock-wallaby	V	V	0	1	31/12/1993
860	Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	koala	V	V	0	942	01/01/2012
2455	Animalia	Mammalia	Pseudocheiridae	*Petauroides volans volans*	southern greater glider	V	V	0	1	31/12/1999
838	Animalia	Mammalia	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SL	None	0	1	31/12/1999
11205	Plantae	Equisetopsida	Apocynaceae	*Marsdenia coronata*	slender milkvine	V	None	1	2	13/02/2017
26403	Plantae	Equisetopsida	Myrtaceae	*Melaleuca irbyana*	None	E	None	8	11	17/12/2018
9680	Plantae	Equisetopsida	Oleaceae	*Notelaea lloydii*	Lloyd's native olive	V	V	1	1	06/06/2018
10401	Plantae	Equisetopsida	Poaceae	*Dichanthium setosum*	None	C	V	1	1	05/04/2018
5210	Plantae	Equisetopsida	Sapotaceae	*Planchonella eerwah*	None	E	E	3	3	12/12/1987

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Endangered (E), Extinct in the Wild (PE), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern(C)).

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V)).

Specimens: The number of specimen-backed records of the taxon.

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Department of Environment and Science

Environmental Reports

Biodiversity and Conservation Values

Biodiversity Planning Assessments and Aquatic Conservation Assessments

For the selected area of interest

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or Area of Interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "Central co-ordinates" option, the resulting assessment area encompasses an area extending from 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: biodiversity.planning@des.qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.

Table of Contents

Summary Information . . . 4
Biodiversity Planning Assessments . . . 6
Introduction . . . 6
Diagnostic Criteria . . . 6
Other Essential Criteria . . . 8
Aquatic Conservation Assessments . . . 14
Introduction . . . 14
Explanation of Criteria . . . 14
Riverine Wetlands . . . 15
Non-riverine Wetlands . . . 16
Threatened and Priority Species . . . 19
Introduction . . . 19
Threatened Species . . . 19
BPA Priority Species . . . 20
ACA Priority Species . . . 21
Maps . . . 23
Map 1 - Locality Map . . . 23
Map 2 - Biodiversity Planning Assessment (BPA) . . . 24
Map 3 - Corridors . . . 25
Map 4 - Wetlands and waterways . . . 26
Map 5 - Aquatic Conservation Assessment (ACA) - riverine . . . 27
Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine . . . 28
References . . . 29
Appendices . . . 30
Appendix 1 - Source Data . . . 30
Appendix 2 - Acronyms and Abbreviations . . . 31

Summary Information

Tables 1 to 8 provide an overview of the AOI with respect to selected topographic and environmental values.

Table 1: Area of interest details:

Size (ha)	11,221.47
Local Government(s)	Scenic Rim Regional, Logan City, Ipswich City
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Logan-Albert, Brisbane

The following table identifies available Biodiversity Planning Assessments (BPAs) and Aquatic Conservation Assessments (ACAs) with respect to the AOI.

Table 2: Available Biodiversity Planning and Aquatic Conservation Assessments

Assessment Type	Assessment Area and Version
Biodiversity Planning Assessment(s)	Southeast Queensland v4.1
Aquatic Conservation Assessment(s) (riverine)	South East Queensland Catchments v1.1
Aquatic Conservation Assessment(s) (non-riverine)	South East Queensland Catchments v1.1

Table 3: Remnant regional ecosystems within the AOI as per the Qld Herbarium's 'biodiversity status'

Biodiversity Status	Area (Ha)	% of AOI
Endangered	148.21	1.32
Of concern	363.18	3.24
No concern at present	666.18	5.94

The following table identifies the extent and proportion of the user specified area of interest (AOI) which is mapped as being of "State", "Regional" or "Local" significance via application of the Queensland Department of Environment and Science's *Biodiversity Assessment and Mapping Methodology* (BAMM).

Table 4: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	1,057.66	9.43
State	591.58	5.27
Regional	320.65	2.86
Local or Other Values	59.57	0.53

Table 5: Non-riverine wetlands intersecting the AOI

Non-riverine wetland types intersecting the area of interest	#
Number of Palustrine wetlands	9
Number of Lacustrine wetlands	10
Total number of non-riverine wetlands	19

NB. The figures presented in the table above are derived from the relevant non-riverine Aquatic Conservation Assessment(s). Later releases of wetland mapping produced via the Queensland Wetland Mapping Program may provide more recent information in regards to wetland extent.

Table 6: Named waterways intersecting the AOI

Name	Permanency
BREMER RIVER	Non-perennial
PURGA CREEK	Non-perennial
TEVIOT BROOK	Non-perennial
WARRILL CREEK	Perennial
WESTERN CREEK	Non-perennial
WOOLLAMAN CREEK	Non-perennial

Refer to **Map 1** for general locality information.

The following two tables identify the extent and proportion of the user specified AOI which is mapped as being of "Very High", "High", "Medium", "Low", or "Very Low" aquatic conservation value for riverine and non-riverine wetlands via application of the Queensland Department of Environment and Science's *Aquatic Biodiversity Assessment and Mapping Method* (AquaBAMM).

Table 7: Summary table, aquatic conservation significance (riverine)

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	0.0	0.0
High	0.0	0.0
Medium	7,280.59	64.88
Low	2,659.35	23.7
Very Low	1,281.78	11.42

Table 8: Summary table, aquatic conservation significance (non-riverine)

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	81.38	0.73
High	0.0	0.0
Medium	14.46	0.13
Low	0.0	0.0
Very Low	13.05	0.12

Biodiversity Planning Assessments

Introduction

The Department of Environment and Science (DES) attributes biodiversity significance on a bioregional scale through a Biodiversity Planning Assessment (BPA). A BPA involves the integration of ecological criteria using the *Biodiversity assessment and Mapping Methodology* (BAMM) and is developed in two stages: 1) **diagnostic criteria**, and 2) **expert panel criteria**. The diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion, while the expert panel criteria allows for the refinement of the mapped information from the diagnostic output by incorporating local knowledge and expert opinion.

The BAMM methodology has application for identifying areas with various levels of significance solely for biodiversity reasons. These include threatened ecosystems or taxa, large tracts of habitat in good condition, ecosystem diversity, landscape context and connection, and buffers to wetlands or other types of habitat important for the maintenance of biodiversity or ecological processes. While natural resource values such as dryland salinity, soil erosion potential or land capability are not dealt with explicitly, they are included to some extent within the biodiversity status of regional ecosystems recognised by the DES.

Biodiversity Planning Assessments (BPAs) assign three levels of overall biodiversity significance.

- **State significance** - areas assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed by other studies/processes as being significant at national or international scales. In addition, areas flagged as being of State significance due to the presence of endangered, vulnerable and/or near threatened taxa, are identified as "State Habitat for EVNT taxa".
- **Regional significance** - areas assessed as being significant for biodiversity at the subregional scale. These areas have lower significance for biodiversity than areas assessed as being of State significance.
- **Local significance and/or other values** - areas assessed as not being significant for biodiversity at state or regional scales. Local values are of significance at the local government scale.

For further information on released BPAs and a copy of the underlying methodology, go to:

http://www.qld.gov.au/environment/plants-animals/biodiversity/planning/

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

The following table identifies the extent and proportion of the user specified AOI which is mapped as being of "State", "Regional" or "Local" significance via application of the BAMM.

Table 9: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	1,057.66	9.43
State	591.58	5.27
Regional	320.65	2.86
Local or Other Values	59.57	0.53

Refer to **Map 2** for further information.

Diagnostic Criteria

Diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion. These criteria are diagnostic in that they are used to filter the available data and provide a "first-cut" or initial determination of biodiversity significance. This initial assessment is then combined through a second group of other essential criteria.

A description of the individual diagnostic criteria is provided in the following sections.

Criteria A. Habitat for EVNT taxa: Classifies areas according to their significance based on the presence of endangered, vulnerable and/or rare (EVNT) taxa. EVNT taxa are those scheduled under the *Nature Conservation Act 1992* and/or the

Environment Protection and Biodiversity Conservation Act 1999. It excludes highly mobile fauna taxa which are instead considered in Criterion H and brings together information on EVNT taxa using buffering of recorded sites or habitat suitability models (HSM) where available.

Criteria B. Ecosystem value: Classifies on the basis of biodiversity status of regional ecosystems, their extent in protected areas (presence of poorly conserved regional ecosystems), the presence of significant wetlands; and areas of national importance such as the presence of Threatened Ecological Communities, World Heritage areas and Ramsar sites. Ecosystem value is applied at a bioregional (**B1**) and regional (**B2**) scale.

Criteria C. Tract size: Measures the relative size of tracts of vegetation in the landscape. The size of any tract is a major indicator of ecological significance, and is also strongly correlated with the long-term viability of biodiversity values. Larger tracts are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller tracts.

Criteria D. Relative size of regional ecosystems: Classifies the relative size of each regional ecosystem unit within its bioregion (**D1**) and its subregion (**D2**). Remnant units are compared with all other occurrences with the same regional ecosystem. Large examples of a regional ecosystem are more significant than smaller examples of the same regional ecosystem because they are more representative of the biodiversity values particular to the regional ecosystem, are more resilient to the effects of disturbance, and constitute a significant proportion of the total area of the regional ecosystem.

Criteria F. Ecosystem diversity: Is an indicator of the number of regional ecosystems occurring within an area. An area with high ecosystem diversity will have many regional ecosystems and ecotones relative to other areas within the bioregion.

Criteria G. Context and connection: Represents the extent to which a remnant unit incorporates, borders or buffers areas such as significant wetlands, endangered ecosystems; and the degree to which it is connected to other vegetation.

A summary of the biodiversity status based upon the diagnostic criteria is provided in the following table.

Table 10: Summary of biodiversity significance based upon diagnostic criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A)	941.62	8.39
State	Remnant contains at least 1 Endangered or 2 Vulnerable or Near Threatened species (A) & Nat. Threatened Ecol. Community (B1)	116.04	1.03
State	Remnant contains at least 1 Endangered RE (B1)	17.84	0.16
Regional	Remnant contains at least 1 Vulnerable or Near Threatened species (A)	611.89	5.45
Regional	Remnant contains at least one Of Concern RE (B1)	90.14	0.8
Regional	Remnant is part of a Tract that is one of the largest in the bioregion (C) & Remnant has high connectivity or buffers an endangered RE or Significant Wetland (G)	46.99	0.42
Local or Other Values	Refer to diagnostic data for additional information	204.94	1.83

Assessment of diagnostic criteria with respect to the AOI

The following table reflects an assessment of the individual diagnostic criteria noted above in regards to the AOI.

Table 11: Assessment of individual diagnostic criteria with respect to the AOI

Diagnostic Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
A: Habitat for EVNT Taxa	1,057.68	9.4	613.42	5.5	282.32	2.5	76.01	0.7
B1: Ecosystem Value (Bioregion)	151.43	1.3	403.62	3.6	619.94	5.5		
B2: Ecosystem Value (Subregion)	141.46	1.3	336.72	3.0	696.81	6.2		
C: Tract Size	338.23	3.0	268.33	2.4	31.77	0.3	536.66	4.8
D1: Relative RE Size (Bioregion)	23.93	0.2	42.83	0.4	208.4	1.9	899.83	8.0
D2: Relative RE Size (Subregion)	23.93	0.2	42.83	0.4	208.4	1.9	899.83	8.0
F: Ecosystem Diversity	35.27	0.3	311.25	2.8	495.94	4.4	332.53	3.0
G: Context and Connection	124.52	1.1	192.01	1.7	593.76	5.3	264.7	2.4

Other Essential Criteria

Other essential criteria (also known as expert panel criteria) are based on non-uniform information sources and which may rely more upon expert opinion than on quantitative data. These criteria are used to provide a "second-cut" determination of biodiversity significance, which is then combined with the diagnostic criteria for an overall assessment of relative biodiversity

significance. A summary of the biodiversity status based upon the other essential criteria is provided in the following table.

Table 12: Summary of biodiversity significance based upon other essential criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains Core Habitat for Priority Taxa (H)	11.1	0.1
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	2.5	0.02
State	Remnant contains Core Habitat for Priority Taxa (H) & Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	6.05	0.05
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	24.15	0.22
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	184.09	1.64
State	Remnant forms part of a bioregional corridor (J)	390.39	3.48
Regional	Remnant contains Core Habitat for Priority Taxa (H)	29.54	0.26
Regional	Remnant contains Core Habitat for Priority Taxa (H) & Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	1.95	0.02
Regional	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	64.71	0.58
Regional	Remnant forms part of a bioregional corridor (J)	129.53	1.15
Local	Refer to Expert Panel data for additional information	35.98	0.32

A description of each of the other essential criteria and associated assessment in regards to the AOI is provided in the following sections.

Criteria H. Essential and general habitat for priority taxa: Priority taxa are those which are at risk or of management concern, taxa of scientific interest as relictual (ancient or primitive), endemic taxa or locally significant populations (such as a flying fox camp or heronry), highly specialised taxa whose habitat requirements are complex and distributions are not well correlated with any particular regional ecosystem, taxa important for maintaining genetic diversity (such as complex spatial patterns of genetic variation, geographic range limits, highly disjunct populations), taxa critical for management or monitoring of biodiversity (functionally important or ecological indicators), or economic and culturally important taxa.

Criteria I. Special biodiversity values: areas with special biodiversity values are important because they contain multiple taxa in a unique ecological and often highly biodiverse environment. Areas with special biodiversity values can include the following:

- Ia - centres of endemism - areas where concentrations of taxa are endemic to a bioregion or subregion are found.
- Ib - wildlife refugia (Morton *et al*. 1995), for example, islands, mound springs, caves, wetlands, gorges, mountain ranges and topographic isolates, ecological refuges, refuges from exotic animals, and refuges from clearing. The latter may include large areas that are not suitable for clearing because of land suitability/capability.
- Ic - areas with concentrations of disjunct populations.
- Id - areas with concentrations of taxa at the limits of their geographic ranges.
- Ie - areas with high species richness.
- If - areas with concentrations of relictual populations (ancient and primitive taxa).
- Ig - areas containing REs with distinct variation in species composition associated with geomorphology and other environmental variables.
- Ih - an artificial waterbody or managed/manipulated wetland considered by the panel/s to be of ecological significance.

- Ii - areas with a high density of hollow-bearing trees that provide habitat for animals.
- Ij - breeding or roosting sites used by a significant number of individuals.
- Ik - climate change refuge.

The following table identifies the value and extent area of the Other Essential Criteria H and I within the AOI.

Table 13: Relative importance of expert panel criteria (H and I) used to access overall biodiversity significance with respect to the AOI

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
H: Core Habitat Priority Taxa	17.15	0.2	34.0	0.3	235.55	2.1	888.29	7.9
Ia: Centres of Endemism			218.43	1.9				
Ib: Wildlife Refugia	76.19	0.7	207.27	1.8				
Ic: Disjunct Populations								
Id: Limits of Geographic Ranges					218.43	1.9		
Ie: High Species Richness			67.66	0.6				
If: Relictual Populations								
Ig: Variation in Species Composition								
Ih: Artificial Wetland								
Ii: Hollow Bearing Trees			67.66	0.6				
Ij: Breeding or Roosting Site								
Ik: Climate Refugia								

NB. Whilst biodiversity values associated with Criteria I may be present within the site (refer to tables 12 and 15), for the New England Tableland and Central Queensland Coast BPAs, area and % area figures associated with Criteria Ia through to Ij cannot be listed in the table above (due to slight variations in data formats between BPAs).

Criteria J. Corridors: areas identified under this criterion qualify either because they are existing vegetated corridors important for contiguity, or cleared areas that could serve this purpose if revegetated. Some examples of corridors include riparian habitats, transport corridors and "stepping stones".

Bioregional and subregional conservation corridors have been identified in the more developed bioregions of Queensland through the BPAs, using an intensive process involving expert panels. Map 3 displays the location of corridors as identified under the Statewide Corridor network. The Statewide Corridor network incorporates BPA derived corridors and for bioregions where no BPA has been assessed yet, corridors derived under other planning processes. *Note: as a result of updating and developing a statewide network, the alignment of corridors may differ slightly in some instances when compared to those used in individual BPAs.*

The functions of these corridors are:

- **Terrestrial** Bioregional corridors, in conjunction with large tracts of remnant vegetation, maintain ecological and evolutionary processes at a landscape scale, by:

  • Maintaining long term evolutionary/genetic processes that allow the natural change in distributions of species and connectivity between populations of species over long periods of time;

  • Maintaining landscape/ecosystems processes associated with geological, altitudinal and climatic gradients, to allow for ecological responses to climate change;

  • Maintaining large scale seasonal/migratory species processes and movement of fauna;

  • Maximising connectivity between large tracts/patches of remnant vegetation;

  • Identifying key areas for rehabilitation and offsets; and

- **Riparian** Bioregional Corridors also maintain and encourage connectivity of riparian and associated ecosystems.

The location of the corridors is determined by the following principles:

- Terrestrial

  • Complement riparian landscape corridors (i.e. minimise overlap and maximise connectivity);

  • Follow major watershed/catchment and/or coastal boundaries;

  • Incorporate major altitudinal/geological/climatic gradients;

  • Include and maximise connectivity between large tracts/patches of remnant vegetation;

  • Include and maximise connectivity between remnant vegetation in good condition; and

- Riparian

  • Located on the major river or creek systems within the bioregion in question.

The total extent of remnant vegetation triggered as being of "State", "Regional" or "Local" significance due to the presence of an overlying BPA derived terrestrial or riparian corridor within the AOI, is provided in the following table. For further information on how remnant vegetation is triggered due to the presence of an overlying BPA derived corridor, refer to the relevant landscape BPA expert panel report(s).

Table 14: Extent of triggered remnant vegetation due to the presence of BPA derived corridors with respect to the AOI

Biodiversity Significance	Area (Ha)	% of AOI
State	580.53	5.17
Regional	129.53	1.15
Local	0.0	0.0

NB: area figures associated with the extent of corridor triggered remnant vegetation are only available for those bioregions where a BPA has been undertaken.

Refer to **Map 3** for further information.

Threatening process/condition (Criteria K) - areas identified by experts under this criterion may be used to amend (upgrade or downgrade) biodiversity significance arising from the "first-cut" analysis. The condition of remnant vegetation is affected by threatening processes such as weeds, ferals, grazing and burning regime, selective timber harvesting/removal, salinity, soil erosion, and climate change.

Assessment of Criteria K with respect to the AOI is not currently included in the "Biodiversity and Conservation Values" report, as it has not been applied to the majority of Queensland due to data/information limitations and availability.

Special Area Decisions

Expert panel derived "Special Area Decisions" are used to assign values to Other Essential Criteria. The specific decisions which relate to the AOI in question are listed in the table below.

Table 15: Expert panel decisions for assigning levels of biodiversity significance with respect to the AOI

Decision Number	Description	Panel Recommended Significance	Criteria Values
seq_fa_02	Lowland rainforest & wet sclerophyll forest	State	Ib (wildlife refugia): VERY HIGH
seqs_fl_30	Teviot Range - Flinders Peak centred on a cluster of intrusive volcanic plugs of Tertiary age (Mts Blaine, Catherine, Goolman, Perry, Welcome, Flinders Peak and Ivorys Rock)	Regional	Ia (SEQ endemic taxa): HIGH Ib (wildlife refugia): HIGH Id (limits of geographic range): MEDIUM
seqs_fl_31	Purga wetland	Regional	Ib (wildlife refugia): VERY HIGH
seqs_l_22	Terrestrial bioregional corridors	State or Regional	Criterion J
seqs_l_49	Riparian bioregional corridors	State	Criterion J
seqs_l_57	Riparian lowland forest systems (other than riparian/gallery rainforests systems)	State	Ib (wildlife refugia): VERY HIGH Ie (high species richness: HIGH Ii (hollow bearing trees): HIGH

Expert panel decision descriptions:

seq_fa_02

Across the entire bioregion, all rainforest and wet sclerophyll forest with a rainforest understory at elevations of < 300m asl be designated as being of State significance. Based on importance for mesic fauna (e.g. Richmond birdwing Ornithoptera richmondia, giant barred-frog Mixophyes iteratus, Fleay's barred-frog Mixophyes fleayi, Coxen's fig-parrot Cyclopsitta diophthalma coxeni), and as drought/fire refugia.

seqs_fl_30

- SEQ endemic taxa (Criterion Ia): Arundinella montana, Cupaniopsis tomentella, Eucalyptus major, Marsdenia coronata, Notelaea lloydii, Planchonella eerwah, Rhodamnia dumicola, Tephrosia sp. (The Grampians L.H.Bird AQ565381), Zieria scopulus (Note - some of the above taxa are based on input at Panel and are not listed in WILDNET).
- Wildlife refugia (Criterion Ib): area to west is changing from rural to urban as part of implementation of SEQ Regional Plan.
- Taxa at limits of geographic range Criterion Id): Acacia obtusifolia, Melaleuca comboynensis - both species occur along Border Ranges to south.

seqs_fl_31

- Wildlife refugia (Criterion Ib): wetland contains an unusual floodplain with anastomotic channels in deep cracking clay soils, with adjacent slopes containing Melaleuca irbyana seasonally flooded forests. Area includes tributaries, floodplain, elevated intermittent marshes and seasonal to permanent low-lying waterholes.

seqs_l_22

The expert panel reviewed the existing bioregional corridors for southern SEQ. Corridors were assigned as being of State or Regional significance.

For further information, refer to section 2.3.2 and 3.2 of this report.

seqs_l_49

The riparian bioregional corridors provide connectivity through lowland areas of SEQ.

See Table 4 for list of waterways considered riparian corridors.

For further information, refer to sections 2.3.2 and 3.2 of this report.

seqs_l_57

Riparian lowland forest ecosystems are important components of the lowland landscape, frequently exhibiting higher species richness and abundance than surrounding habitats. They act as movement pathways along riparian systems for a number of species, especially birds. They also often provide critical resources for many species in terms of food, shelter and nesting sites. For example, the seasonal flowering of melaleuca is important for species of honeyeaters, whilst narrow bands of flooded gum along watercourses are significant habitat for koalas Phascolarctos cinereus, especially in times of drought. Large trees in these systems also act as a source of nest hollows for many species of birds, bats and arboreal mammals. (Lovett Price 2007)

Due to historical and preferential clearing in SEQ, remaining systems are often heavily fragmented and have undergone a substantial reduction in their extent. In many areas, condition is often poor and subject to considerable weed problems.

Values include:

- Wildlife refugia (Criterion Ib).
- High species richness (Criterion Ie).
- Larger trees in such systems are often a significant source of nest hollows (Criterion Ii).

Note - for the same decision relevant to the northern portion of the SEQ bioregion refer to seqn_l_50.

Aquatic Conservation Assessments

Introduction

The Aquatic Biodiversity Assessment and Mapping Method or AquaBAMM (Clayton *et al.* 2006), was developed to assess conservation values of wetlands in queensland, and may also have application in broader geographical contexts. It is a comprehensive method that uses available data, including data resulting from expert opinion, to identify relative wetland conservation/ecological values within a specified study area (usually a catchment). The product of applying this method is an Aquatic Conservation Assessment (ACA) for the study area.

An ACA using AquaBAMM is non-social, non-economic and identifies the conservation/ecological values of wetlands at a user-defined scale. It provides a robust and objective conservation assessment using criteria, indicators and measures that are founded upon a large body of national and international literature. The criteria, each of which may have variable numbers of indicators and measures, are naturalness (aquatic), naturalness (catchment), diversity and richness, threatened species and ecosystems, priority species and ecosystems, special features, connectivity and representativeness. An ACA using AquaBAMM is a powerful decision support tool that is easily updated and simply interrogated through a geographic information system (GIS).

Where they have been conducted, ACAs can provide a source of baseline wetland conservation/ecological information to support natural resource management and planning processes. They are useful as an independent product or as an important foundation upon which a variety of additional environmental and socio-economic elements can be added and considered (i.e. an early input to broader 'triple-bottom-line' decision-making processes). An ACA can have application in:

- determining priorities for protection, regulation or rehabilitation of wetlands and other aquatic ecosystems
- on-ground investment in wetlands and other aquatic ecosystems
- contributing to impact assessment of large-scale development (e.g. dams)
- water resource and strategic regional planning prcesses

For a detailed explanation of the methodology please refer to the summary and expert panel reports relevant to the ACA utilised in this assessment. These reports can be accessed at Wetland *Info*:

http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

Explanation of Criteria

Under the AquaBAMM, eight criteria are assessed to derive an overall conservation value. Similar to the Biodiversity Assessment and Mapping Methodology, the criteria may be primarily diagnostic (quantitative) or primarily expert opinion (qualitative) in nature. The following sections provide a brief description of each of the 8 criteria.

Criteria 1. Naturalness - Aquatic: This attribute reflects the extent to which a wetland's (riverine, non-riverine, estuarine) aquatic state of naturalness is affected through relevant influencing indicators which include: presence of exotic flora and fauna; presence of aquatic communities; degree of habitat modification and degree of hydrological modification.

Criteria 2. Naturalness - Catchment: The naturalness of the terrestrial systems of a catchment can have an influence on many wetland characteristics including: natural ecological processes e.g. nutrient cycling, riparian vegetation, water chemistry, and flow. The indicators utilised to assess this criterion include: presence of exotic flora and/or fauna; riparian, catchment and flow modification.

Criteria 3. Naturalness - Diversity and Richness: This criterion is common to many ecological assessment methods and can include both physical and biological features. It includes such indicators as species richness, riparian ecosystem richness and geomorphological diversity.

Criteria 4. Threatened Species and Ecosystems: This criterion evaluates ecological rarity characteristics of a wetland. This includes both species rarity and rarity of communities / assemblages. The communities and assemblages are best represented by regional ecosystems. Species rarity is determined by NCA and EPBC status with Endangered, Vulnerable or Near-threatened species being included in the evaluation. Ecosystem rarity is determined by regional ecosystem biodiversity status i.e. Endangered, Of Concern, or Not of Concern.

Criteria 5. Priority Species and Ecosystems: Priority flora and fauna species lists are expert panel derived. These are aquatic, semi-aquatic and riparian species which exhibit at least 1 particular trait in order to be eligible for consideration. For

flora species the traits included:

- It forms significant macrophyte beds (in shallow or deep water).
- It is an important food source.
- It is important/critical habitat.
- It is implicated in spawning or reproduction for other fauna and/or flora species.
- It is at its distributional limit or is a disjunct population.
- It provides stream bank or bed stabilisation or has soil binding properties.
- It is a small population and subject to threatening processes.

Fauna species are included if they meet at least one of the following traits:

- It is endemic to the study area (>75 per cent of its distribution is in the study area/catchment).
- It has experienced, or is suspected of experiencing, a serious population decline.
- It has experienced a significant reduction in its distribution and has a naturally restricted distribution in the study area/catchment.
- It is currently a small population and threatened by loss of habitat.
- It is a significant disjunct population.
- It is a migratory species (other than birds).
- A significant proportion of the breeding population (>one per cent for waterbirds, >75 per cent other species) occurs in the waterbody (see Ramsar criterion 6 for waterbirds).
- Limit of species range.

See the individual expert panel reports for the priority species traits specific to an ACA.

Criteria 6. Special Features: Special features are areas identified by flora, fauna and ecology expert panels which exhibit characteristics beyond those identified in other criteria and which the expert panels consider to be of the highest ecological importance. Special feature traits can relate to, but are not solely restricted to geomorphic features, unique ecological processes, presence of unique or distinct habitat, presence of unique or special hydrological regimes e.g. spring-fed streams. Special features are rated on a 1 - 4 scale (4 being the highest).

Criteria 7. Connectivity: This criterion is based on the concept that appropriately connected aquatic ecosystems are healthy and resilient, with maximum potential biodiversity and delivery of ecosystem services.

Criteria 8. Representativeness: This criterion applies primarily to non-riverine assessments, evaluates the rarity and uniqueness of a wetland type in relation to specific geographic areas. Rarity is determined by the degree of wetland protection within "protected Areas" estate or within an area subject to the *Fisheries Act 1994*, *Coastal Protection and Management Act 1995*, or *Marine Parks Act 2004*. Wetland uniqueness evaluates the relative abundance and size of a wetland or wetland management group within geographic areas such as catchment and subcatchment.

Riverine Wetlands

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water. AquaBAMM, when applied to riverine wetlands uses a discrete spatial unit termed subsections. A subsection can be considered as an area which encompasses discrete homogeneous stream sections in terms of their natural attributes (i.e. physical, chemical, biological and utilitarian values) and natural resources. Thus in an ACA, an aquatic conservation significance score is calculated for each subsection and applies to all streams within a subsection, rather than individual streams as such.

Please note, the area figures provided in Tables 16 and 17, are derived using the extent of riverine subsections within the AOI. Refer to **Map 5** for further information. A summary of the conservation significance of riverine wetlands within the AOI is provided in the following table.

Table 16: Overall level/s of riverine aquatic conservation significance

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	0.0	0.0

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
High	0.0	0.0
Medium	7,280.59	64.88
Low	2,659.35	23.7
Very Low	1,281.78	11.42

The individual aquatic conservation criteria ratings for riverine wetlands within the AOI are listed below.

Table 17: Level/s of riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic			2,834.80	25.3	8,386.93	74.7		
2. Naturalness catchment			4,400.05	39.2	3,565.03	31.8	3,256.65	29.0
3. Diversity and richness	814.15	7.3	5,549.38	49.5	4,784.25	42.6	73.95	0.7
4. Threatened species and ecosystems					8,599.21	76.6		
5. Priority species and ecosystems	2,671.77	23.8	1,812.18	16.1	5,456.01	48.6		
6. Special features								
7. Connectivity	1,219.97	10.9			1,522.92	13.6	8,478.84	75.6
8. Representative-ness								

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to riverine wetlands within the AOI.

Table 18: Expert panel decisions for assigning overall levels of riverine aquatic conservation significance

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
(No Records)				

4 is the highest rating/value

Expert panel decision descriptions:

(No Records)

Non-riverine Wetlands

Non-riverine wetlands include both lacustrine and palustrine wetlands, however, do not currently incorporate estuarine, marine or subterranean wetland types. A summary of the conservation significance of non-riverine wetlands within the AOI is provided in the following table. Refer to **Map 6** for further information.

Table 19: Overall level/s of non-riverine aquatic conservation significance

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	81.38	0.73
High	0.0	0.0
Medium	14.46	0.13
Low	0.0	0.0
Very Low	13.05	0.12

The following table provides an assessment of non-riverine wetlands within the AOI and associated aquatic conservation criteria values.

Table 20: Level/s of non-riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic			25.13	0.2	54.66	0.5	29.1	0.3
2. Naturalness catchment			4.94		56.7	0.5	47.25	0.4
3. Diversity and richness	28.65	0.3	22.51	0.2	49.41	0.4	8.32	0.1
4. Threatened species and ecosystems	79.93	0.7	13.57	0.1	1.61			
5. Priority species and ecosystems	30.49	0.3	50.03	0.4	14.15	0.1		
6. Special features	81.38	0.7						
7. Connectivity								
8. Representative-ness	68.32	0.6	13.06	0.1				

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to non-riverine wetlands within the AOI.

Table 21: Expert panel decisions for assigning overall levels of non-riverine aquatic conservation significance.

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
br_nr_ec_01	Oxbows	Bremer	6.3.1	4
br_nr_ec_02	Purga wetlands	Bremer	6.3.1	4
br_nr_ec_03	Ephemeral wetlands	Bremer	5.2.1, 6.3.1	4, 4
br_nr_fa_01	Aratula wetlands	Bremer	5.1.4	4
lg_nr_ec_04	Ephemeral wetlands	Logan	5.2.1, 6.3.1	4,4

4 is the highest rating/value

Expert panel decision descriptions:

br_nr_ec_01

Oxbow lakes RE 12.3.7c. Similar refugial values to RE 12.3.8 (possibly better as they are wetter for longer). Old palaeo-channels that have near permanent water and provide fish refuge in times of floods. Characterised by hollow forming bluegums.

br_nr_ec_02

Melaleuca irbayana present (EPBC Act threatened ecological community), oxbow lakes, 10 to 15 semi-permanent and permanent pools. Diverse habitat of small wetlands. Not captured in the wetland mapping except for some small wetlands.

br_nr_ec_03

Ephemeral wetlands RE 12.3.8. Regardless of condition (e.g. grazing, weeds), these wetlands have important refugial values in highly degraded landscapes. Unique wetland type. Distinctive RE type. Most mapped as their own wetland.

br_nr_fa_01

Significant waterbird habitat.

lg_nr_ec_04

Ephemeral wetlands RE 12.3.8. Regardless of condition (e.g. grazing, weeds), these wetlands have important refugial values in highly degraded landscapes. Unique wetland type. Distinctive RE type. Most mapped as their own wetland.

Threatened and Priority Species

Introduction

This chapter contains a list of threatened and priority flora and/or fauna species that have been recorded on, or within 4km of the Assessment Area.

The information presented in this chapter with respect to species presence is derived from compiled databases developed primarily for the purpose of BPAs and ACAs. Data is collated from a number of sources and is updated periodically.

It is important to note that the list of species provided in this report, may differ when compared to other reports generated from other sources such as the State government's WildNet, Herbrecs or the federal government's EPBC database for a number of reasons.

Records for threatened and priority species are filtered and checked based on a number of rules including:

- Taxonomic nomenclature - current scientific names and status,
- Location - cross-check co-ordinates with location description,
- Taxon by location - requires good knowledge of the taxon and history of the record,
- Duplicate records - identify and remove,
- Expert panels - check records and provide new records,
- Flora cultivated records excluded,
- Use precise records less than or equal to 2000m,
- Use recent records greater than or equal to 1975 animals, greater than or equal to 1950 plants.

Threatened Species

Threatened species are those species classified as "Endangered" or "Vulnerable" under the *Environment Protection and Biodiversity Conservation Act 1999* or "Endangered", "Vulnerable" or "Near threatened" under the *Nature Conservation Act 1992*.

The following threatened species have been recorded on, or within approximately 4km of the AOI.

Table 22: Threatened species recorded on, or within 4km of the AOI

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Adelotus brevis	tusked frog	V		Medium		Y	FA
Callitris baileyi	Bailey's cypress	NT		High			FL
Cupaniopsis tomentella	Boonah tuckeroo	V	V	Low			FL
Dasyurus maculatus maculatus	spotted-tailed quoll (southern subspecies)	V	E	High			FA
Marsdenia coronata	slender milkvine	V		Low			FL
Melaleuca irbyana		E		Medium			FL
Ninox strenua	powerful owl	V		Medium			FA
Notelaea lloydii	Lloyd's native olive	V	V	Low			FL
Numenius madagascariensis	eastern curlew	E	CE	Low	Y	Y	FA
Petauroides volans	greater glider	V	V	Low			FA
Petrogale penicillata	brush-tailed rock-wallaby	V	V	High			FA

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Phascolarctos cinereus	koala	V	V	Low			FA
Phascolarctos cinereus	Koala	V	V				FA
Planchonella eerwah		E	E	Low			FL
Rostratula australis	Australian painted snipe	V	E	Medium		Y	FA
Sophora fraseri	brush sophora	V	V	Low			FL
Turnix melanogaster	black-breasted button-quail	V	V	Critical			FA

NB. Please note that the threatened species listed in this section are based upon the most recently compiled DES internal state-wide threatened species dataset. This dataset may contain additional records that were not originally available for inclusion in the relevant individual BPAs and ACAs.

**JAMBA - Japan-Australia Migratory Bird Agreement; CAMBA - China-Australia Migratory Bird Agreement; ROKAMBA - Republic of Korea-Australia Migratory Bird Agreement; CMS - Convention on the Conservation of Migratory Species*.

***Y - wetland indicator species*.

BPA Priority Species

A list of BPA priority species that have been recorded on, or within approximately 4km of the AOI is contained in the following table.

Table 23: Priority species recorded on, or within 4km of the AOI

Species	Common name	Back on Track rank	Identified flora/fauna
Cheramoeca leucosterna	White-backed Swallow	Low	FA
Cherax dispar	Lobby	Low	FA
Cyclorana alboguttata	Greenstripe Frog	Low	FA
Cyclorana brevipes	Superb Collared Frog	Low	FA
Delma plebeia	Common Delma	Medium	FA
Ephippiorhynchus asiaticus	Black-necked Stork	Low	FA
Erythrina numerosa			FL
Fastosarion papillosa	Black-tasselled Semi-slug		FA
Gossia hillii			FL
Limnodynastes salmini	Salmon Striped Frog	Low	FA
Litoria brevipalmata	Green-thighed Frog	Medium	FA
Litoria dentata	Bleating Treefrog	Low	FA
Melithreptus gularis	Black-chinned Honeyeater	Low	FA
Mormopterus norfolkensis	East-coast Freetail Bat	Low	FA
Mugil cephalus	Sea Mullet	Low	FA
Nautiliropa omicron	Red-flamed Pinwheel Snail		FA
Phascogale tapoatafa tapoatafa	Brush-tailed Phascogale	Low	FA
Pomatostomus temporalis	Grey-crowned Babbler		FA
Pseudechotrida bordaensis	Lamington Carnivorous Snail		FA

Species	Common name	Back on Track rank	Identified flora/fauna
Pteropus alecto	Black Flying-fox	Low	FA
Rhodamnia dumicola	rib-fruited malletwood		FL
Rhodamnia rubescens			FL
Scoteanax rueppellii	Greater Broad-nosed Bat	Medium	FA
Squamagenia separanda	Pine Rivers Bristle Snail		FA
Syzygium oleosum	blue cherry		FL
Terrycarlessia bullacea	Bunya Mountains Carnivorous Snail		FA
Trachystoma petardi	Pinkeye Mullet	Low	FA

NB. Please note that the list of priority species is based on those species identified in the BPAs, however records for these species may be more recent than the originals used. furthermore, the BPA priority species databases are updated from time to time. At each update, the taxonomic details for all species are amended as necessary to reflect current taxonomic name and/or status changes.

ACA Priority Species

A list of ACA priority species used in riverine and non-riverine ACAs that have been recorded on, or within approximately 4km of the AOI are contained in the following tables.

Table 24: Priority species recorded on, or within 4 km of the AOI - riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Acrocephalus australis	Australian Reed-Warbler	L	FA
Anguilla australis	Southern Shortfin Eel	L	FA
Anguilla reinhardtii	Longfin Eel	L	FA
Ardea ibis	Cattle Egret	Low	FA
Ardea modesta	Eastern Great Egret	Low	FA
Castanospermum australe	black bean		FL
Casuarina glauca	swamp she-oak		FL
Eucalyptus tereticornis			FL
Ficus coronata	creek sandpaper fig		FL
Ficus fraseri	white sandpaper fig		FL
Ficus macrophylla			FL
Haliaeetus leucogaster	White-bellied Sea-Eagle	L	FA
Hydrilla verticillata	hydrilla		FL
Macquaria novemaculeata	Australian Bass	L	FA
Melaleuca viminalis		L	FL
Mugil cephalus	Sea Mullet	L	FA
Rostratula australis	Australian Painted Snipe	M	FA
Trachystoma petardi	Pinkeye Mullet	L	FA
Typha domingensis			FL
Typha orientalis	broad-leaved cumbungi		FL

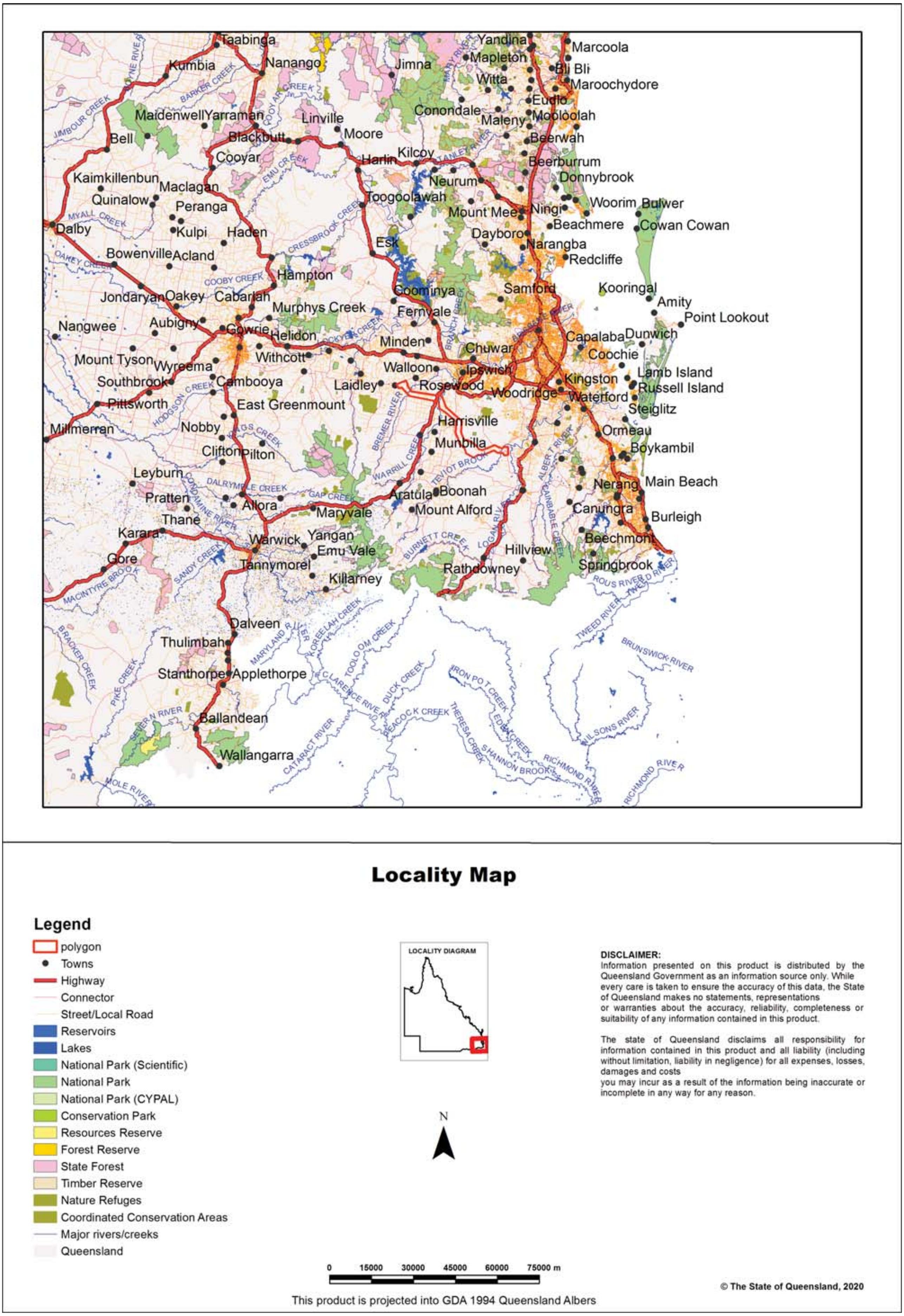
Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Acrocephalus australis	Australian Reed-Warbler	L	FA
Anguilla australis	Southern Shortfin Eel	L	FA
Anguilla reinhardtii	Longfin Eel	L	FA
Ardea ibis	Cattle Egret	Low	FA
Ardea modesta	Eastern Great Egret	Low	FA
Calidris melanotos	Pectoral Sandpiper	L	FA
Cherax dispar	Lobby	L	FA
Cyclorana alboguttata	Greenstripe Frog	L	FA
Cyclorana brevipes	Superb Collared Frog	L	FA
Eucalyptus tereticornis			FL
Haliaeetus leucogaster	White-bellied Sea-Eagle	L	FA
Limnodynastes salmini	Salmon Striped Frog	L	FA
Plegadis falcinellus	Glossy Ibis	L	FA
Rostratula australis	Australian Painted Snipe	M	FA
Tringa stagnatilis	Marsh Sandpiper	L	FA
Typha domingensis			FL
Typha orientalis	broad-leaved cumbungi		FL

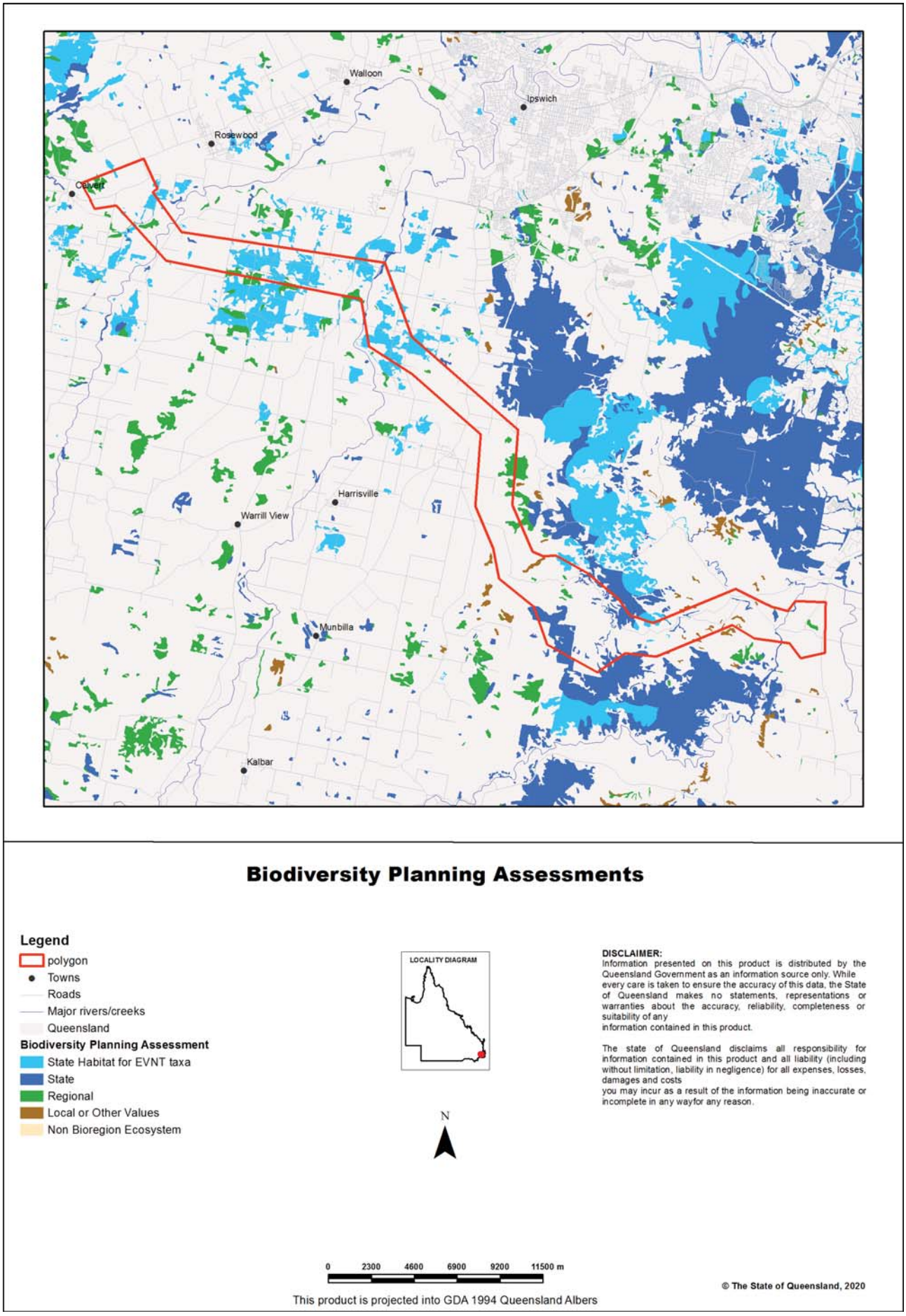
NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details for all ACAs records are amended as necessary to reflect current taxonomic name and/or status changes.

Maps

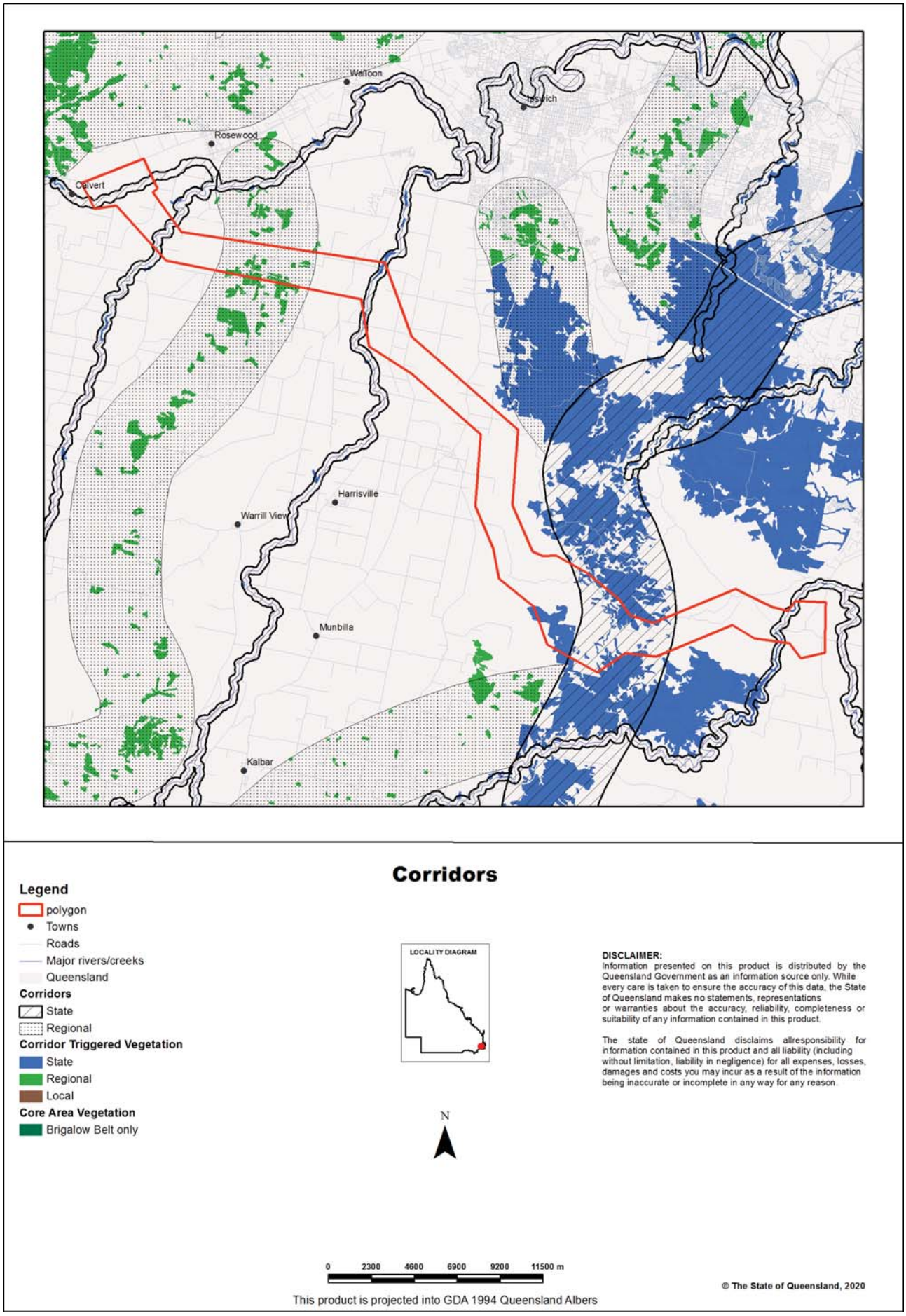
Map 1 - Locality Map



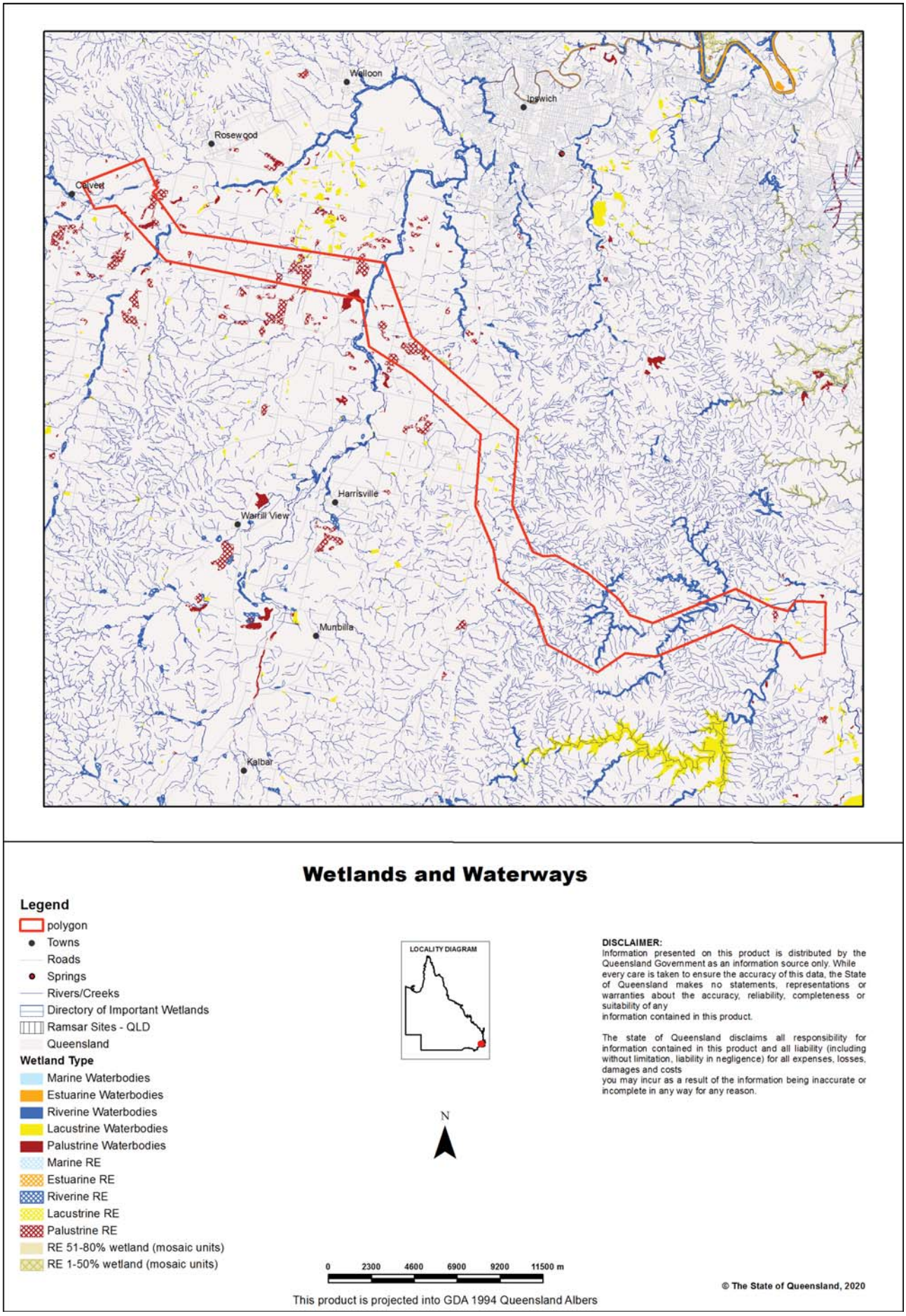
Map 2 - Biodiversity Planning Assessment (BPA)



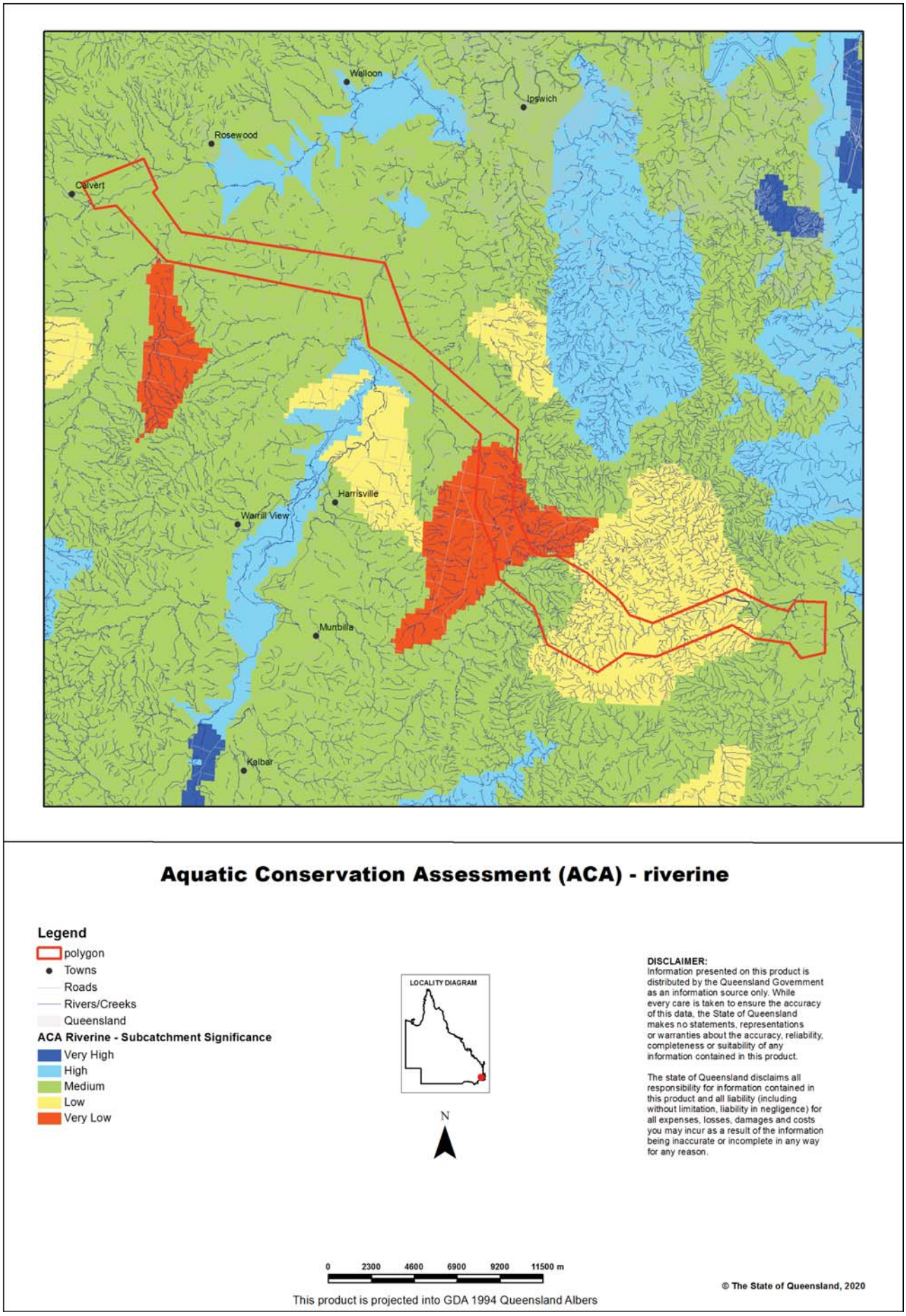
Map 3 - Corridors



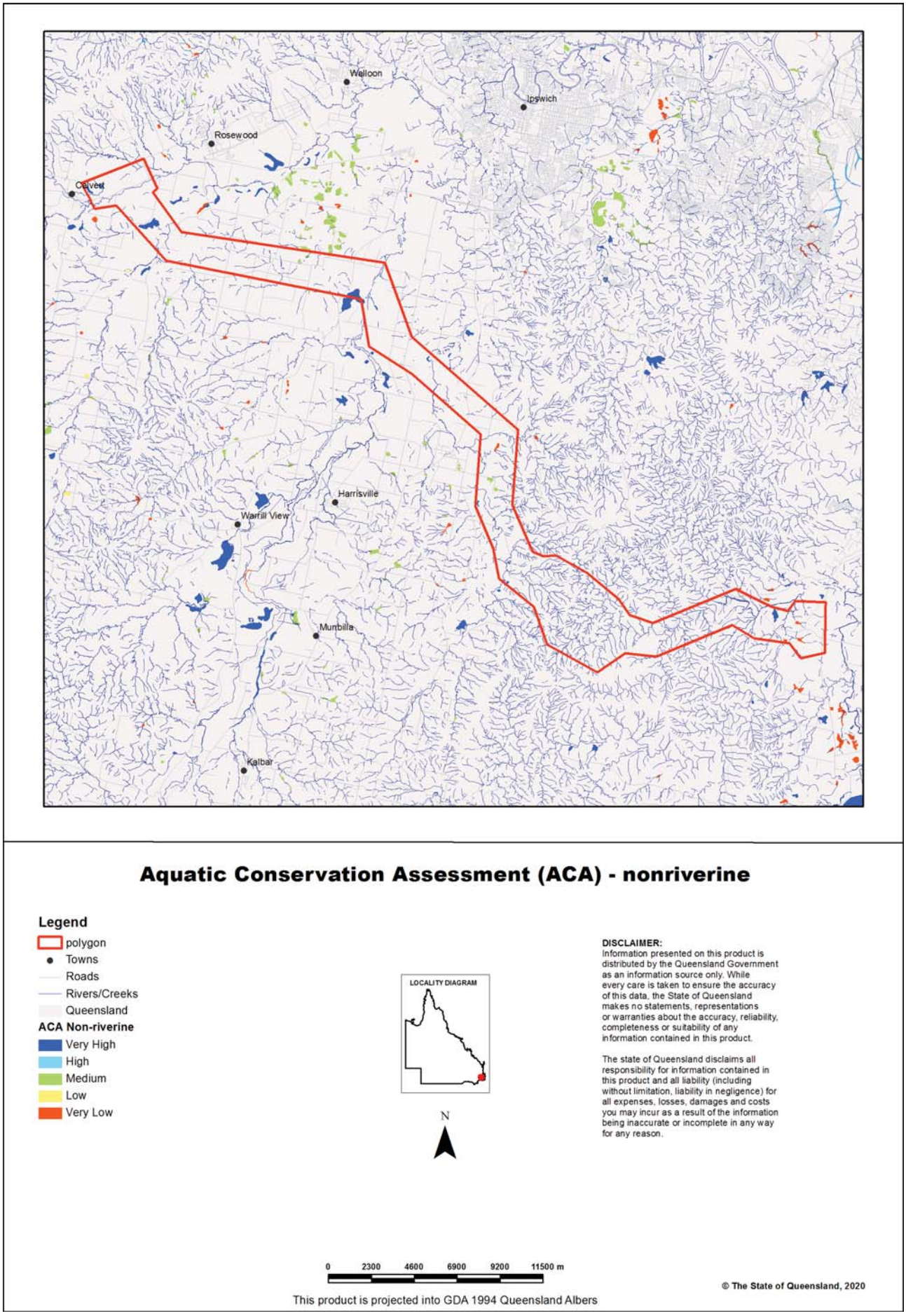
Map 4 - Wetlands and waterways



Map 5 - Aquatic Conservation Assessment (ACA) - riverine



Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine



References

Clayton, P.D., Fielder, D.F., Howell, S. and Hill, C.J. (2006) *Aquatic biodiversity assessment and mapping method (AquaBAMM): a conservation values assessment tool for wetlands with trial application in the Burnett River catchment.* Published by the Environmental Protection Agency, Brisbane. ISBN 1-90928-07-3. Available at

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Morton, S. R., Short, J. and Barker, R. D. with an Appendix by G.F. Griffin and G. Pearce (1995). *Refugia for Biological Diversity in Arid and Semi-arid Australia. Biodiversity Series* , Paper No. 4, Biodiversity Unit, Environment Australia.

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Appendices

Appendix 1 - Source Data

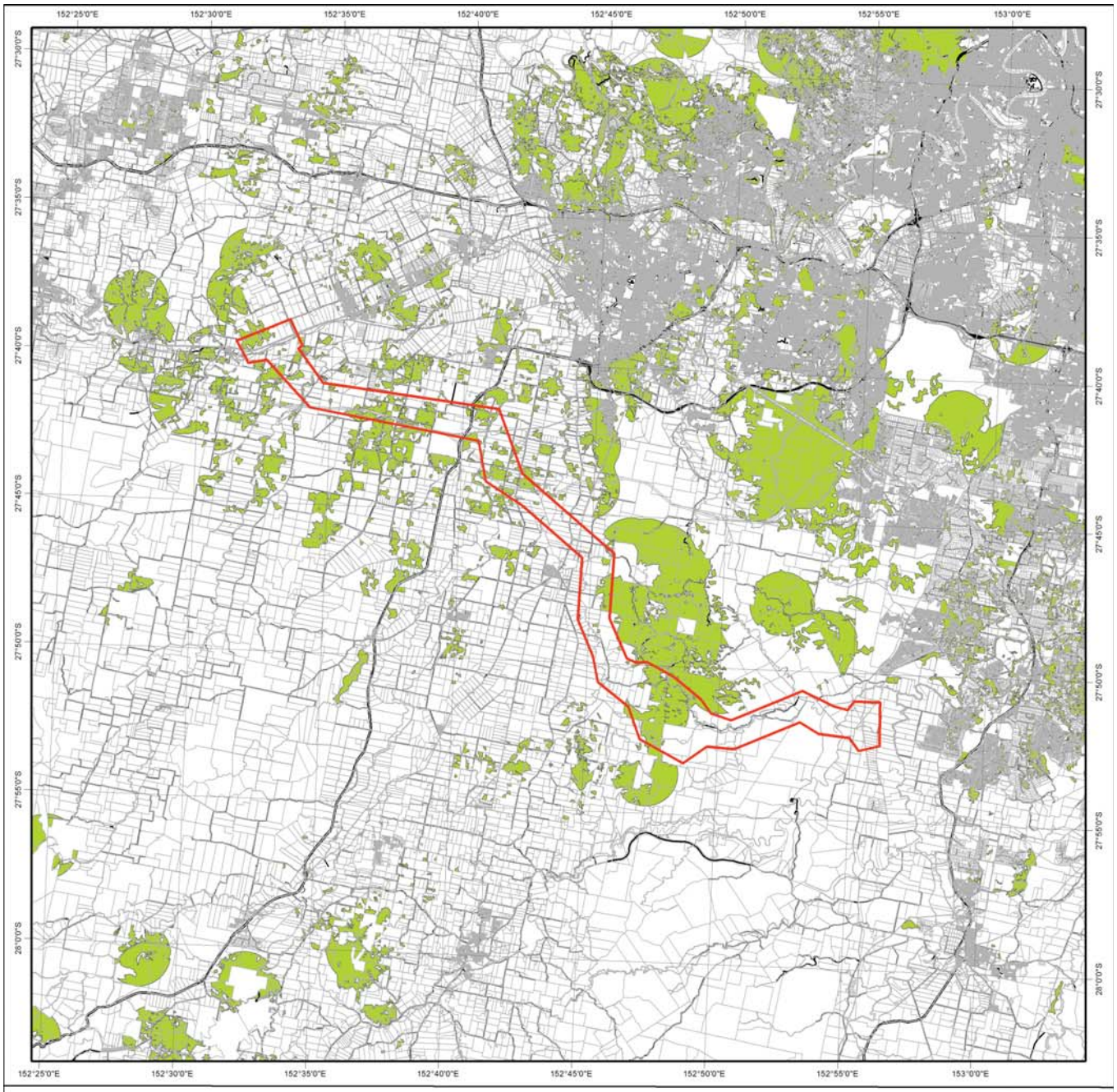
Theme	Datasets
Aquatic Conservation Assessments Non-riverine*	Combination of the following datasets: Cape York Peninsula Non-riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Non-riverine v1.3 Lake Eyre and Bulloo Basins v1.1 QMDB Non-riverine ACA v1.4 Southeast Queensland ACA v1.1 WBB Non-riverine ACA v1.1
Aquatic Conservation Assessments Riverine*	Combination of the following datasets: Cape York Peninsula Riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Riverine v1.1 Lake Eyre and Bulloo Basins v1.1 QMDB Riverine ACA v1.4 Southeast Queensland ACA v1.1 WBB Riverine ACA v1.1
Biodiversity Planning Assessments*	Combination of the following datasets: Brigalow Belt BPA v2.1 Cape York Peninsula BPA v1.1 Central Queensland Coast BPA v1.3 Channel Country BPA v1.1 Desert Uplands BPA v1.3 Einasleigh Uplands BPA v1.1 Gulf Plains BPA v1.1 Mitchell Grass Downs BPA v1.1 Mulga Lands BPA v1.4 New England Tableland v2.3 Southeast Queensland v4.1 Wet Tropics v1.1
Statewide BPA Corridors*	Statewide corridors v1.5
Threatened Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
BPA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.

***These datasets are available at:**

http://dds.information.qld.gov.au/DDS

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
ACA	- Aquatic Conservation Assessment
AQUABAMM	- Aquatic Biodiversity Assessment and Mapping Methodology
BAMM	- Biodiversity Assessment and Mapping Methodology
BoT	- Back on Track
BPA	- Biodiversity Planning Assessment
CAMBA	- China-Australia Migratory Bird Agreement
DES	- Department of Environment and Science
EPBC	- *Environment Protection and Biodiversity Conservation Act 1999*
EVNT	- Endangered, Vulnerable, Near Threatened
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement



Protected Plants Flora Survey Trigger Map

Legend

- polygon
- High risk area
- Cadastral line
  Property boundaries shown are provided as a locational aid only
- Freeways / motorways / highways
- Secondary roads / streets

LOCALITY DIAGRAM

N

0 2,400 4,800 7,200 9,600 12,000 m

This product is projected into:
GDA 1994 Queensland Albers

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science at palm@ehp.qld.gov.au

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

Protected plants flora survey trigger map

The protected plants flora survey trigger map identifies 'high risk areas' where endangered, vulnerable or near threatened plants are known to exist or are likely to exist. Under the *Nature Conservation Act 1992* (the Act) it is an offence to clear protected plants that are 'in the wild' unless you are authorised or the clearing is exempt, for more information see section 89 of the Act.

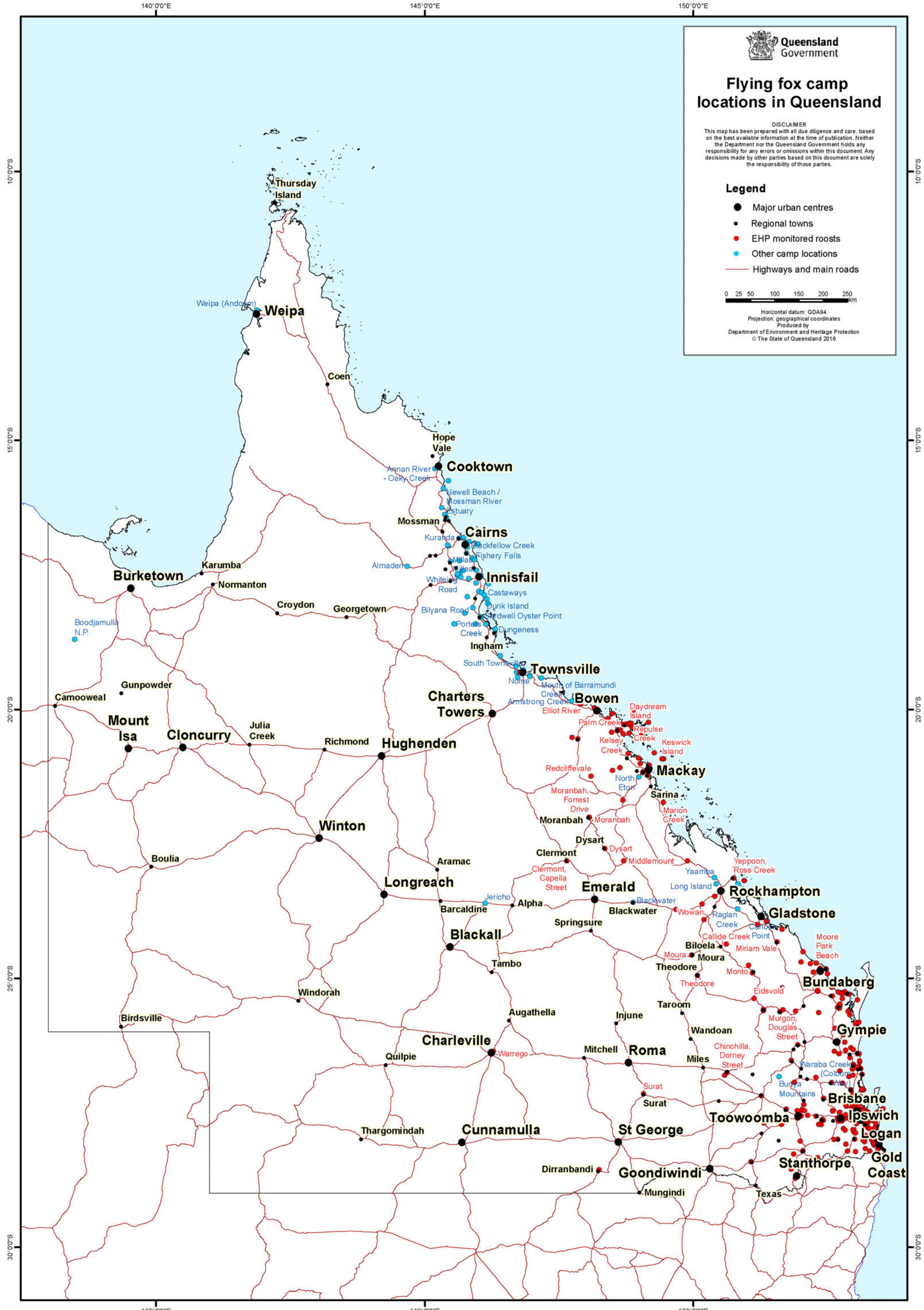
Please see the Department of Environment and Science webpage on the clearing of protected plants for information on what exemptions may apply in your circumstances, whether you may need to undertake a flora survey, and whether you may need a protected plants clearing permit.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of Environment and Science does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment and Science webpage on the clearing of protected plants for more information.


Queensland Government
Flying fox camp locations in Queensland
DISCLAIMER
This map has been prepared with all due diligence and care, based on the best available information at the time of publication. Neither the Department nor the Queensland Government holds any responsibility for any errors or omissions within this document. Any decisions made by other parties based on this document are solely the responsibility of those parties.
Legend
Major urban centres
Regional towns
EHP monitored roosts
Other camp locations
Highways and main roads
0 25 50 100 150 200 250 km
Horizontal datum: GDA94
Projection: geographical coordinates
Produced by
Department of Environment and Heritage Protection
© The State of Queensland 2016
140°0'0"E
145°0'0"E
150°0'0"E
10°0'0"S
15°0'0"S
20°0'0"S
25°0'0"S
30°0'0"S
Thursday Island
Weipa (Andoom)
Weipa
Coen
Hope Vale
Cooktown
Annan River - Oaky Creek
Newell Beach / Mossman River Estuary
Mossman
Cairns
Kuranda
Blackfellow Creek
Fishery Falls
Almaden
Innisfail
Whiteing Road
Castaways
Dunk Island
Bilyana Road
Cardwell Oyster Point
Porters Creek
Dungeness
Ingham
South Townsville
Townsville
Nome
Mouth of Barramundi Creek
Armstrong Creek
Bowen
Elliot River
Daydream Island
Palm Creek
Repulse Creek
Kelsey Creek
Keswick Island
Redcliffevale
Mackay
North Eton
Moranbah, Forrest Drive
Sarina
Marion Creek
Moranbah
Dysart
Clermont
Middlemount
Clermont, Capella Street
Yeppoon, Ross Creek
Yaamba
Long Island
Rockhampton
Emerald
Jericho
Alpha
Blackwater
Wowan
Raglan Creek
Gladstone
Canoe Point
Springsure
Callide Creek
Biloela
Miriam Vale
Moore Park Beach
Moura
Theodore
Monto
Bundaberg
Eidsvold
Taroom
Tambo
Augathella
Injune
Wandoan
Murgon, Douglas Street
Gympie
Charleville
Warrego
Mitchell
Roma
Miles
Chinchilla, Dorney Street
Waraba Creek (Colburn Way)
Bunya Mountains
Surat
Brisbane
Toowoomba
Ipswich
Logan
Cunnamulla
St George
Dirranbandi
Goondiwindi
Stanthorpe
Gold Coast
Mungindi
Texas
Burketown
Karumba
Normanton
Croydon
Georgetown
Boodjamulla N.P.
Gunpowder
Camooweal
Mount Isa
Cloncurry
Julia Creek
Richmond
Hughenden
Charters Towers
Winton
Boulia
Aramac
Longreach
Barcaldine
Blackall
Windorah
Birdsville
Quilpie
Thargomindah

Queensland Government

Flying fox camp locations
SOUTH EAST REGION

DISCLAIMER
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Legend

- flying fox camps (current on 10 Feb 2016)
- Major urban centres
- Regional centres
- Roads
- Principal rivers
- Local government boundaries
- Urban areas
- Water bodies

Protected Areas of Queensland

- National Park
- National Park (CYPAL)
- Regional Park
- Forest Reserve
- State Forest
- Timber Reserve

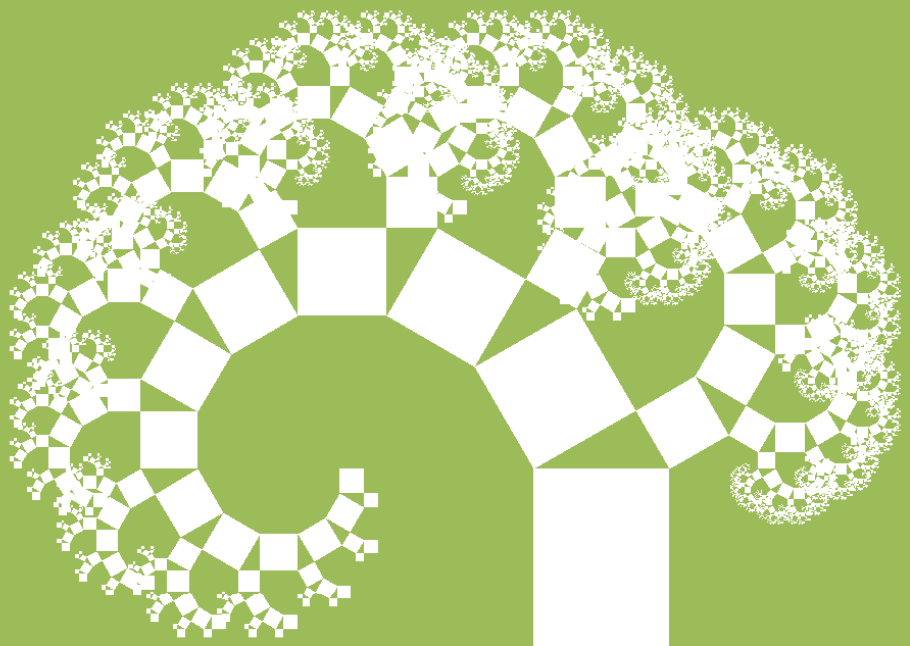
0 2.5 5 10 15 20 25 km

Horizontal datum: GDA94
Projection: geographical coordinates
Produced by
Department of Environment and Heritage Protection

152°0'0"E 152°30'0"E 153°0'0"E 153°30'0"E

26°30'0"S 27°0'0"S 27°30'0"S 28°0'0"S 28°30'0"S

Goomeri
Gympie
CHERBOURG SHIRE COUNCIL
GYMPIE REGIONAL COUNCIL
Cooroy
Tewantin
Nambour
Buderim
Maroochydore
Caloundra
Nanango
SUNSHINE COAST REGIONAL COUNCIL
Yarraman
SOUTH BURNETT REGIONAL COUNCIL
Blackbutt
SOMERSET REGIONAL COUNCIL
Kilcoy
Caboolture
MORETON BAY REGIONAL COUNCIL
Redcliffe
TOOWOOMBA REGIONAL COUNCIL
Esk
Crows Nest
BRISBANE CITY COUNCIL
Brisbane
REDLAND CITY COUNCIL
Gatton
Laidley
Rosewood
Ipswich
IPSWICH CITY COUNCIL
Logan
LOGAN CITY COUNCIL
Beenleigh
LOCKYER VALLEY REGIONAL COUNCIL
SCENIC RIM REGIONAL COUNCIL
Boonah
Beaudesert
Southport
Surfers Paradise
GOLD COAST CITY COUNCIL
Gold Coast
Coolangatta
Tweed Heads
Warwick
SOUTHERN DOWNS REGIONAL COUNCIL



Modelled potential habitat

For the selected area of interest 11221.47ha

Current as at 06/02/2020

Queensland Government

Introduction

Species lists in this report are derived from Maxent pre-clear potential habitat models and buffered point coverages produced by the Queensland Herbarium for NCA listed 'endangered' or 'vulnerable' species, EPBC listed 'critically endangered', 'endangered' or 'vulnerable' species and other priority species.

The models utilise records of fauna species occurrence compiled for the purpose of Biodiversity Assessment by the Queensland Department of Environment and Resource Management (EPA 2002) and specimen backed flora records compiled from the Queensland Herbarium's Herbrecs database. All records have a location precision of better than 2000 m, and all fauna records are less than 50 years old. Models were constrained within an occurrence mask for each species, defined by a buffer of 200 km around a convex hull that encompasses all records. All models were based on seven environmental layers, annual mean temperature, temperature seasonality (coefficient of variation), annual precipitation, mean moisture index of the lowest quarter moisture index, pre-clearing broad vegetation group (1:1M), land zone and taxonomic ruggedness. Climate layers were modelled using Anuclim software on an 83 m digital elevation model. A mask of Queensland's road network was used to down-weight species records collected along roads. Model performance was assessed by comparing the area under the ROC curve (AUC) with the 95th percentile AUC from 1000 null models for each species created by randomly selecting locations from within the minimum convex hull of species presence records. For species with very restricted ranges, model performance was further tested using randomly selected locations from within the species mask. Thresholds were applied (either equal training sensitivity and specificity logistic threshold or 10th percentile training presence logistic threshold, whichever was highest) in order to convert model output to a prediction of potential habitat. Any presence records excluded by the threshold applied were incorporated into the output with a 1km buffer. The output was clipped to the species mask and simplified using a majority filter algorithm to remove outlying orphan cells in the model output. The resulting shapefile defines the modelled pre-clear potential habitat for selected threatened and priority species.

If a species is not listed in the report, it does not indicate that its habitat is absent from the queried location and conversely, species listed may not currently inhabit the area.

Threatened fauna species

Threatened fauna species modelled to have pre-clear potential habitat within the area of interest , with an area of 11221.47ha hectares

Threatened Species animals

Class	Scientific name	Common name	NCA Status	EPBC Status	Area (ha)
birds	*Cyclopsitta diophthalma coxeni*	Coxen's fig-parrot	E	E	25.45
birds	*Grantiella picta*	painted honeyeater	V	V	304.91
birds	*Lathamus discolor*	swift parrot	E	CE	11123.98
birds	*Calyptorhynchus lathami*	glossy black-cockatoo	V	None	5446.14
birds	*Erythrotriorchis radiatus*	red goshawk	E	V	11220.17
birds	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)	V	V	7379.39
birds	*Botaurus poiciloptilus*	Australasian bittern	C	E	9695.84
birds	*Turnix melanogaster*	black-breasted button-quail	V	V	4834.53
birds	*Rostratula australis*	Australian painted snipe	V	E	11218.66
birds	*Ninox strenua*	powerful owl	V	None	6412.11
mammals	*Petrogale penicillata*	brush-tailed rock-wallaby	V	V	1113.63
mammals	*Nyctophilus corbeni*	eastern long-eared bat	V	V	368.82
mammals	*Phascolarctos cinereus*	koala	V	V	10840.7
mammals	*Chalinolobus dwyeri*	large-eared pied bat	V	V	96.09
mammals	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)	V	E	5351.17
mammals	*Pteropus poliocephalus*	grey-headed flying-fox	C	V	7913.65
mammals	*Potorous tridactylus tridactylus*	long-nosed potoroo	V	V	8.36
reptiles	*Hemiaspis damelii*	grey snake	E	None	7613.91
reptiles	*Delma torquata*	collared delma	V	V	7979.31

Threatened flora species

Threatened flora species modelled to have pre-clear potential habitat within the selected area

Threatened Species plants

Class	Scientific name	Common name	NCA Status	EPBC Status	Area (ha)
cycads	*Cycas megacarpa*	None	E	E	229.08

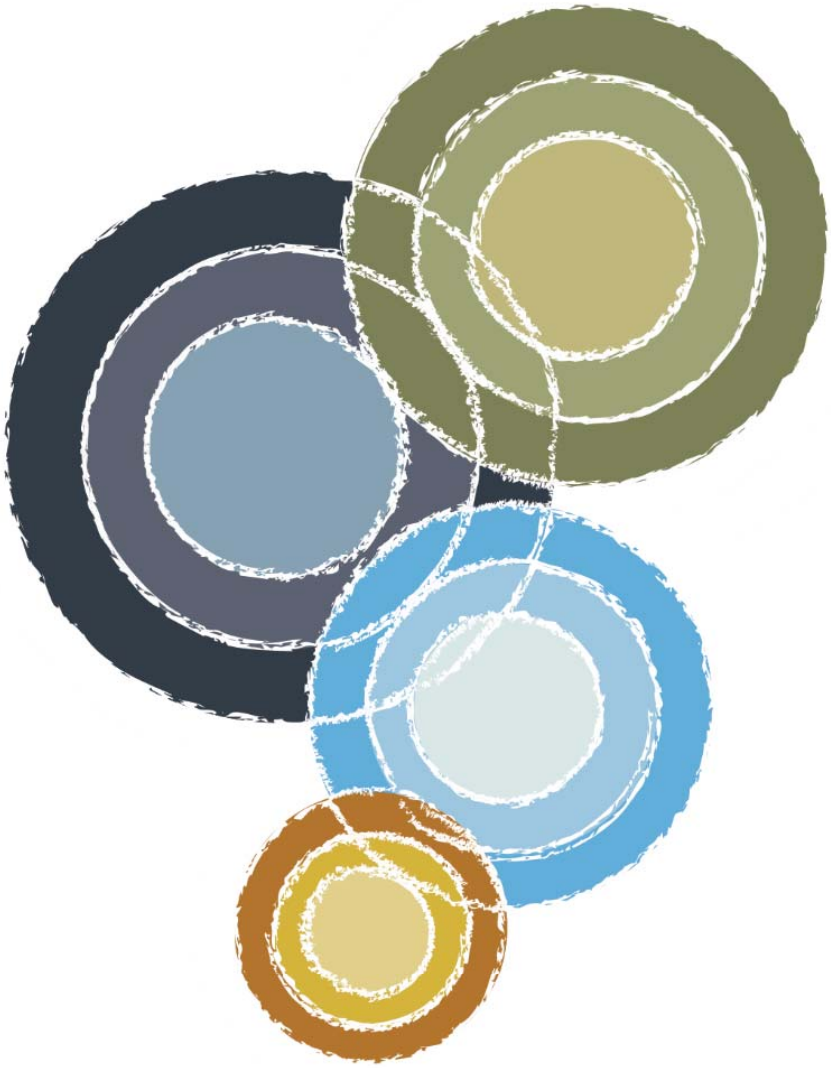
Class	Scientific name	Common name	NCA Status	EPBC Status	Area (ha)
higher dicots	*Fontainea venosa*	None	V	V	34.48
higher dicots	*Melaleuca irbyana*	None	E	None	6657.19
higher dicots	*Bertya opponens*	None	C	V	7747.84
higher dicots	*Corchorus cunninghamii*	None	E	E	93.54
higher dicots	*Rhaponticum australe*	None	V	V	90.74
higher dicots	*Notelaea lloydii*	Lloyd's native olive	V	V	5092.27
higher dicots	*Planchonella eerwah*	None	E	E	3982.66
higher dicots	*Bosistoa transversa*	three-leaved bosistoa	C	V	71.59
higher dicots	*Marsdenia coronata*	slender milkvine	V	None	4601.85
higher dicots	*Leptospermum oreophilum*	None	V	None	286.14
higher dicots	*Lepidium peregrinum*	None	C	E	27.92
higher dicots	*Sophora fraseri*	brush sophora	V	V	573.57
higher dicots	*Pomaderris coomingalensis*	None	E	None	1898.48
higher dicots	*Denhamia parvifolia*	None	V	V	14.11
higher dicots	*Gossia gonoclada*	None	E	E	346.06
higher dicots	*Samadera bidwillii*	None	V	V	294.37
higher dicots	*Cossinia australiana*	None	E	E	976.87
higher dicots	*Cupaniopsis tomentella*	Boonah tuckeroo	V	V	216.52
higher dicots	*Polianthion minutiflorum*	None	V	V	1528.5
higher dicots	*Thesium australe*	toadflax	V	V	3309.91
monocots	*Dichanthium setosum*	None	C	V	3194.99
monocots	*Cyperus clarus*	None	V	None	2849.65
monocots	*Arthraxon hispidus*	None	V	V	9730.19
monocots	*Dichanthium queenslandicum*	None	V	E	31.81

Links and support

Modelled potential habitat for selected threatened and priority species in Queensland - access the geodatabase of modelled potential habitat for Queensland's threatened species.

Disclaimer

WetlandMaps Report



For selected area of interest

Current as at 06/02/2020

Environmental Reports - General Information

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is ot present within the Area of Interest(AOI) (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the mapping of water bodies and wetland regional ecosystems across Queensland. The Queensland wetland mapping was produced using existing information including water body mapping derived from Landsat satellite imagery, regional ecosystem mapping, topographic data, and a springs database. The result is a consistent wetland map for the whole of Queensland.

Ancillary data, such as higher resolution imagery (for example SPOT and aerial photographs), other vegetation and wetland mapping, geology, soil and land system mapping was also used in attributing and assessing the derived Queensland Wetlands Program wetland mapping products.

The wetland mapping was done in accordance with a detailed peer reviewed methodology which included quality assurance measures for all steps in the process. For more detailed information on how the Queensland Wetlands Program wetland mapping was produced, please see the Wetland Mapping and Classification Methodology.

Disclaimer

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The user accepts sole responsibility and risk associated with the use and results of department data hosted on this website, irrespective of the purpose to which such use or results are applied. It is recommended that users consider independently verifying any information obtained from this website.

To the maximum extent permitted by applicable law, in no event shall the department be liable for any special, incidental, indirect, or consequential loss whatsoever (including, but not limited to, damages for loss of profits or confidential or other information, for business interruption, for personal injury, for loss of privacy, for failure to meet any duty including of good faith or of reasonable care, for negligence, for any other pecuniary or other loss whatsoever including, without limitation, legal costs on a solicitor own client basis) arising out of, or in any way related to, the use of or inability to use the data.

Summary Information

The following table provides an overview of the area of interest.

Table 1. Area of interest details

Size (ha)	11,221.47
Local Government(s)	Scenic Rim Regional, Logan City, Ipswich City
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Logan-Albert, Brisbane
Drainage sub-basin	Logan River, Bremer River

NRM Regions

The following NRM region(s) are in the area of interest:

Healthy Land and Water

Water Resource Plan Boundaries

The following Water Resource Plan(s) are in the area of interest:

Logan Basin

Moreton

Great Artesian Basin and Other Regional Aquifers

Learn more about how Wetlands are mapped in Queensland:

Queensland Wetlands Mapping Definitions

Wetlands are areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 metres. To be a wetland the area must have one or more of the following attributes:

- at least periodically the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time.

Examples under this definition **include**:

- those areas shown as a river, stream, creek, swamp, lake, marsh, waterhole, wetland, billabong, pool or spring on the latest Sunmap 1:25,000, 1:50,000, 1:100,000 or 1:250,000 topographic map
- areas defined as wetlands on local or regional maps prepared with the aim of mapping wetlands
- wetland regional ecosystems (REs) as defined by the Queensland Herbarium (Environmental Protection Agency 2005a)
- areas containing recognised hydrophytes as provided by the Queensland Herbarium
- saturated parts of the riparian zone
- artificial wetlands such as farm dams
- water bodies not connected to rivers or flowing water such as billabongs and rock pools.

Examples under this definition **exclude**:

- areas that may be covered by water but are not wetlands according to the definition

- floodplains that are intermittently covered by flowing water but do not meet the hydrophytes and soil criteria
- riparian zone above the saturation level.

Wetland Systems

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water.

Palustrine wetlands are primarily vegetated non-channel environments of less than 8 hectares. They include billabongs, swamps, bogs, springs, soaks etc, and have more than 30% emergent vegetation.

Lacustrine wetlands are large, open, water-dominated systems (for example, lakes) larger than 8ha. This definition also applies to modified systems (for example, dams), which are similar to lacustrine systems (for example, deep, standing or slow-moving waters).

Marine wetlands include the area of ocean from the coastline or estuary, extending to the jurisdictional limits of Queensland waters (3 nautical mile limit). This definition differs from that in Ramsar, as it includes waters deeper than 6m below the lowest astronomical tide.

Estuarine wetlands are those with oceanic water sometimes diluted with freshwater run-off from the land.

Subterranean wetlands are wetlands occurring below the surface of the ground and that are fed by groundwater i.e. caves and aquifers. These wetlands provide water to groundwater dependent ecosystems.

Methodology and Wetland Classification: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wetland-background/

Links and support

Other sites that deliver wetland related information include:

Wetland*Summary* tool: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/

Queensland Spatial Catalogue: http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

Queensland Globe: https://qldglobe.information.qld.gov.au/

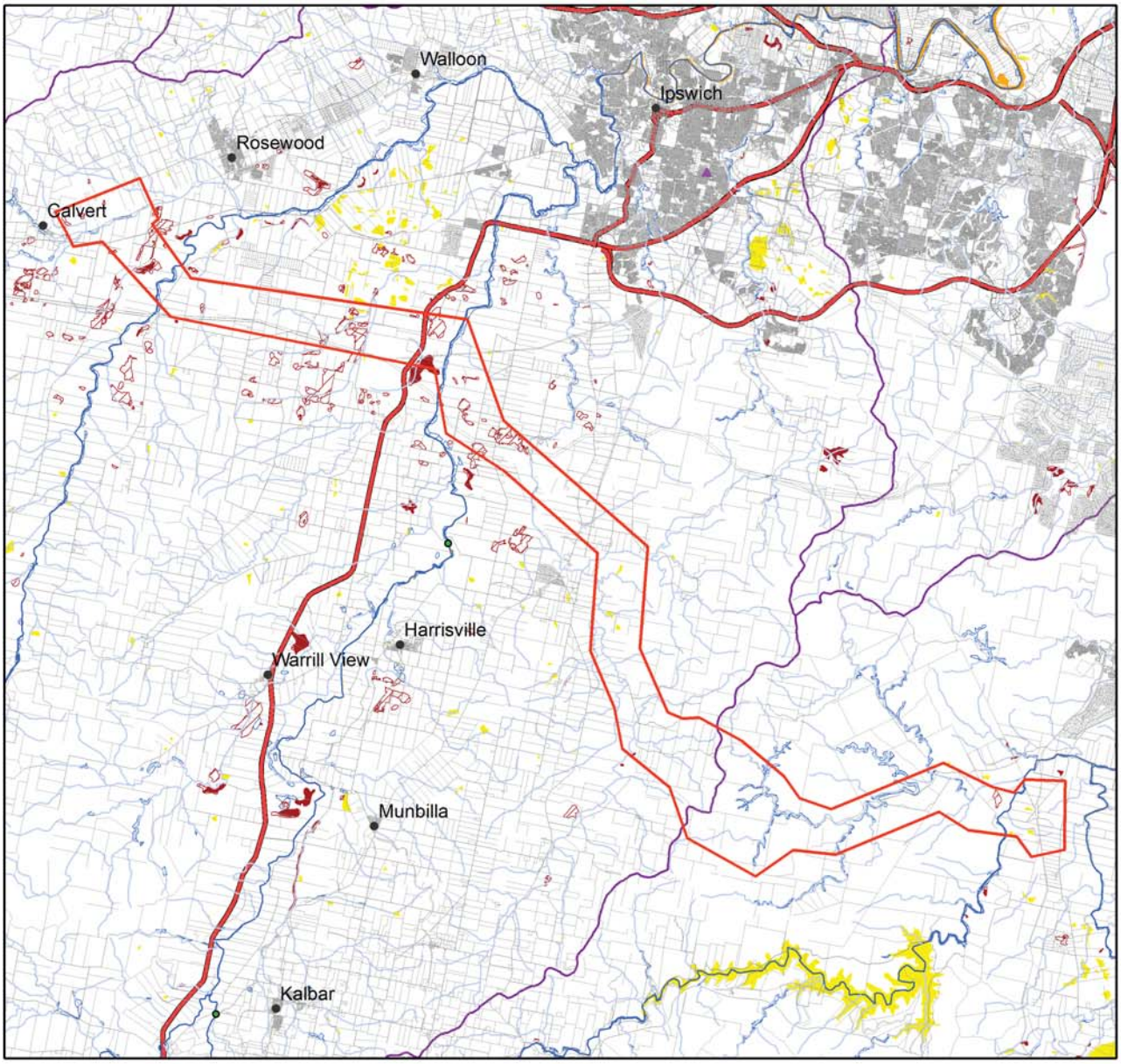
Environmental reports online: https://environment.ehp.qld.gov.au/report-request/environment/

Wetland on-line education modules: https://wetlandinfo.des.qld.gov.au/wetlands/resources/training/

Regional Ecosystem Mapping information: : https://www.qld.gov.au/environment/plants-animals/plants/herbarium/mapping-ecosystems

Aquatic Conservation Assessments: : https://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/

Groundwater Dependant Ecosystems information: https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/



Legend

- polygon
- Springs
- Dams and weirs
- Towns
- Highways
- Roads
- Cadastral boundaries
- Sub-basin

Wetland Mapping

Wetland System - Water Bodies

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies

Wetland System - Regional Ecosystems

- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51_80% wetland (mosaic units)

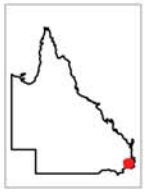
Riverine System Drainage Lines

- Major
- Minor

Queensland Wetland Map

Queensland Government
Australian Government

Queensland Wetlands Program



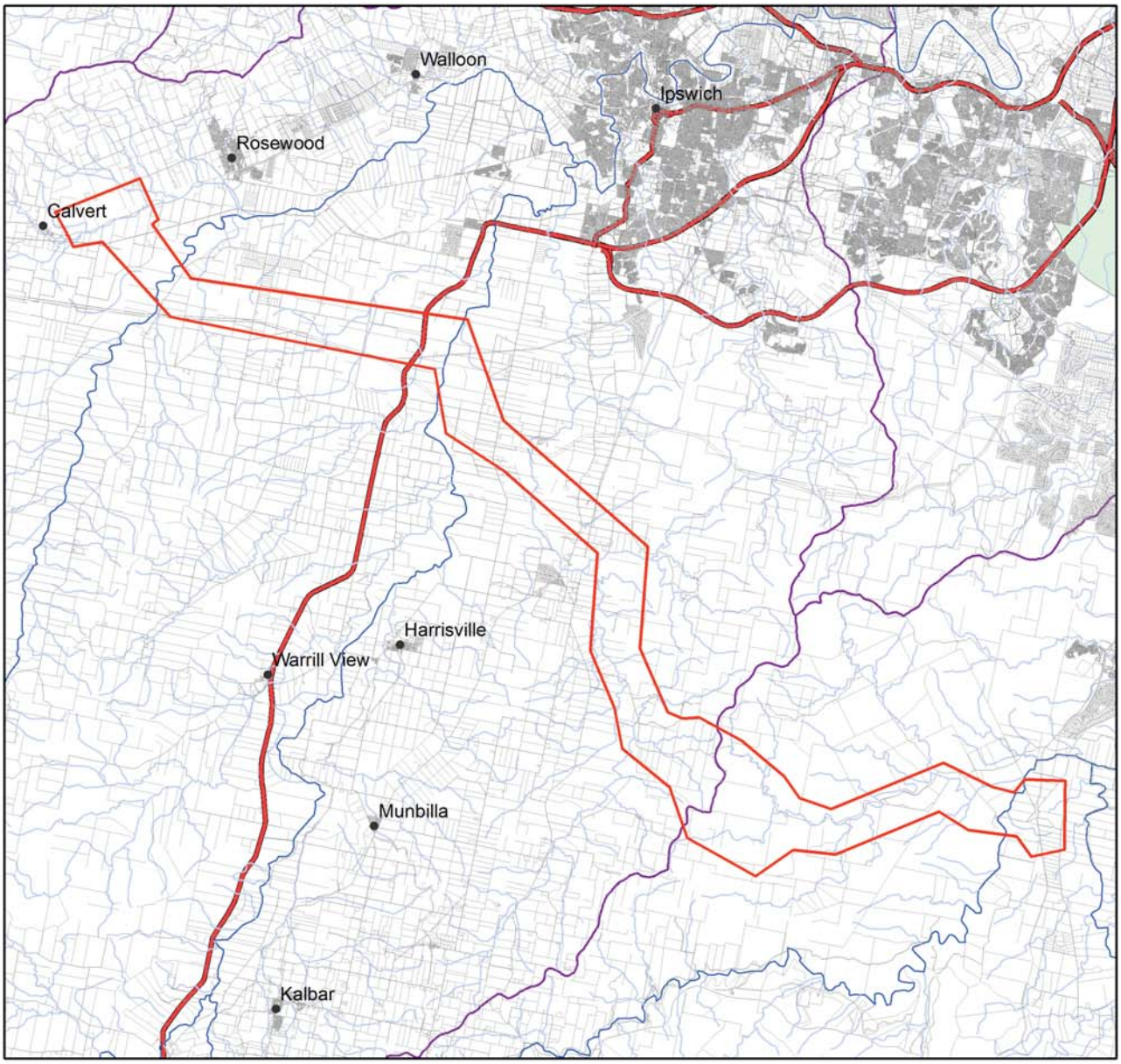
N

0 2300 4600 6900 9200 11500 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, February 2020.

For further information contact: wetlands@des.qld.gov.au



Queensland Wetlands of Importance Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin
- Directory of Important Wetlands
- Ramsar Wetlands

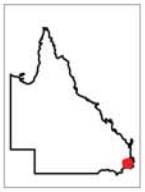
Riverine System Drainage Lines

- Major
- Minor

Queensland Government

Australian Government

Queensland Wetlands Program



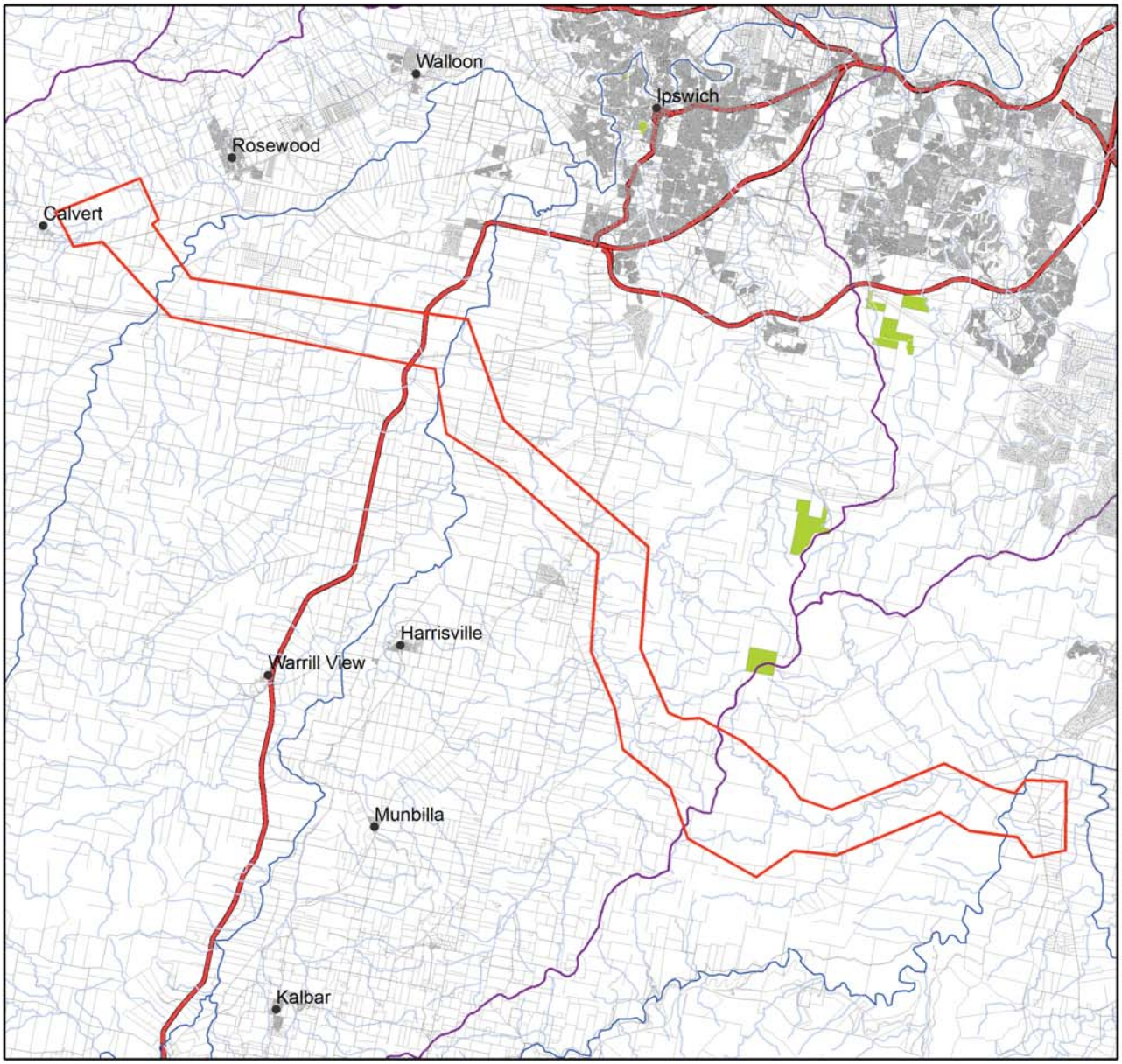
N

0 2300 4600 6900 9200 11500 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, February 2020.

For further information contact: wetlands@des.qld.gov.au



Queensland Protected Area Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin

Riverine System Drainage Lines

- Major
- Minor

Protected Areas

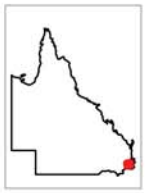
- National Park
- National Park (Scientific)
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve

Marine Parks

- General Use Zone
- Habitat Protection Zone
- Estuarine Conservation Zone
- Conservation Park Zone
- Buffer Zone
- Scientific Research Zone
- Marine National Park Zone
- Preservation Zone

Queensland Government
Australian Government

Queensland Wetlands Program



N

0 2300 4600 6900 9200 11500 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, February 2020.

For further information contact: wetlands@des.qld.gov.au

Wetland habitat types in the AOI. Total area: 575.74ha

Wetland Class	Habitat type	Area (ha)
Riverine	Riverine	195.05
Palustrine	Coastal/ Sub-Coastal non-floodplain tree swamps (Melaleuca and Eucalypt)	137.01
Palustrine	Coastal/ Sub-coastal floodplain tree swamps (Melaleuca and Eucalypt)	131.74
Palustrine	Coastal/ Sub-coastal floodplain grass, sedge and herb swamps	82.04
Lacustrine	Artificial/ highly modified wetlands (dams, ring tanks, irrigation channel	29.63
None	Coastal/ Sub-coastal floodplain grass, sedge and herb swamps	0.27

Queensland wetland habitat typology: Major wetland habitat types for wetland conceptual models and wetland management profiles

Wetland name	Conceptual model	Wetland profile
Mangrove Wetlands	Not developed	Mangrove Wetlands
Saltmarsh Wetlands	Not developed	Saltmarsh Wetlands
Coastal and subcoastal saline swamps of all substrates, water regimes, topographic types and vegetation communities	Coastal and subcoastal saline swamps	Coastal grass-sedge wetlands
Coastal and subcoastal non-floodplain tree swamps (Melaleuca and Eucalypt) of all substrates and water regimes	Coastal and subcoastal non-floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal non-floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal non-floodplain grass, sedge and herb swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain grass, sedge and herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal spring swamps of all substrates, water types, water regimes and vegetation communities	Coastal and subcoastal spring swamps	Great Artesian Basin spring wetlands
Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt of all substrates and water regimes	Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal floodplain, grass, sedge herb swamps of all substrates and water regimes	Coastal and subcoastal floodplain grass, sedge, herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal tree swamps - palm of all substrates, topographic types and water regimes	Coastal and subcoastal floodplain tree swamps - palm	Coastal Palm Swamps
Coastal and subcoastal Floodplain Lakes of all substrates, water types and water regimes	Coastal and subcoastal Floodplain Lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Coastal and subcoastal non-floodplain rock lakes of all water types and water regimes	Coastal and subcoastal non-floodplain rock lakes	Coastal and subcoastal non-floodplain rock lakes
Coastal and subcoastal non-floodplain sand lakes (window) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - window	Coastal non-floodplain sand lakes

Wetland name	Conceptual model	Wetland profile
Coastal and subcoastal non-floodplain sand lakes (perched) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - perched	Coastal non-floodplain sand lakes
Coastal and subcoastal non-floodplain soil lakes of all water types and water regimes	Coastal and subcoastal non-floodplain soil lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Arid and semi-arid saline swamps of all substrates, water regimes, topographic types and vegetation communities	Arid and semi-arid saline swamps	Semi-arid swamps
Arid and semi-arid fresh tree swamps of all substrates, and water regimes and topographic types	Arid and semi-arid tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid lignum swamps of all substrates, and water regimes and topographic types	Arid and semi-arid lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid grass, sedge, herb swamps of all substrates, water regimes and topographic types	Arid and semi-arid grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain tree swamps of all substrates and water regimes	Arid and semi-arid non-floodplain tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain lignum swamps of all substrates and water regimes	Arid and semi-arid non-floodplain lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain grass, sedge, herb swamps of all substrates and water regimes	Arid and semi-arid non-floodplain grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid, non-floodplain swamps - springs of all substrates, water regimes and vegetation communities	Arid and semi-arid spring swamps	Great Artesian Basin spring wetlands
Arid and semi-arid, saline lakes of all substrates, topographic types and water regimes	Arid and semi-arid saline lakes	Arid and semi-arid lakes
Arid and semi-arid, floodplain lakes of all, substrates and water regimes	Arid and semi-arid floodplain lakes	Arid and semi-arid lakes
Arid and semi-arid, non-floodplain Lakes of all substrates and water regimes	Arid and semi-arid non-floodplain lakes	Arid and semi-arid lakes
Arid/ semi-arid, non-floodplain (clay pans) lakes of all substrates and water regimes	Arid and semi-arid fresh non-floodplain lakes (clay pans)	Arid and semi-arid lakes
Arid and semi-arid, Permanent Lakes permanently inundated lakes of all substrates, water types, topographic types and vegetation communities	Arid and semi-arid permanent lakes	Arid and semi-arid lakes

Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the input coordinates.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the Queensland Herbarium's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Natural Resources, Mines and Energy website

https://www.dnrme.qld.gov.au/

Please direct queries about these reports to: Queensland.Herbarium@dsiti.qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.

Table of Contents

Summary Information 4
Regional Ecosystems 5
1. Introduction 5
2. Remnant Regional Ecosystems 6
3. Remnant Regional Ecosystems by Broad Vegetation Group 8
4. Technical and BioCondition Benchmark Descriptions 10
Maps 12
Map 1 - Location 12
Map 2 - Remnant 2017 regional ecosystems 13
Map 3 - Pre-clearing regional ecosystems 14
Map 4 - Remnant 2017 regional ecosystems by BVG (5M) 15
Map 5 - Pre-clearing regional ecosystems by BVG (5M) 16
Map 6 - Wetlands and waterways 17
Links and Other Information Sources 18
References 18
Appendices 19
Appendix 1 - Source Data 19
Appendix 2 - Acronyms and Abbreviations 20

Summary Information

The following table provides an overview of the AOI with respect to selected topographic and environmental themes. Refer to **Map 1** for locality information.

Table 1: Area of interest details:

Size (ha)	11,221.47
Local Government(s)	Scenic Rim Regional, Logan City, Ipswich City
Bioregion(s)	Southeast Queensland
Subregion(s)	Moreton Basin
Catchment(s)	Logan-Albert, Brisbane

The table below summarizes the extent of remnant vegetation classed as "Endangered", "Of concern" and "No concern at present" regional ecosystems classified by Biodiversity Status within the area of interest (AOI).

Table 2: Summary table, biodiversity status of regional ecosystems within the AOI

Biodiversity Status	Area (Ha)	% of AOI
Endangered	148.21	1.32
Of concern	363.18	3.24
No concern at present	666.18	5.94
Total remnant vegetation	1,177.57	10.49

Refer to **Map 2** for further information.

Regional Ecosystems

1. Introduction

Regional ecosystems are vegetation communities in a bioregion that are consistently associated with particular combinations of geology, landform and soil (Sattler and Williams 1999). Descriptions of Queensland's Regional ecosystems are available online from the Regional Ecosystem Description Database (REDD). Descriptions are compiled from a broad range of information sources including vegetation, land system and geology survey and mapping and detailed vegetation site data. The regional ecosystem classification and descriptions are reviewed as new information becomes available. A number of vegetation communities may form a single regional ecosystem and are usually distinguished by differences in dominant species, frequently in the shrub or ground layers and are denoted by a letter following the regional ecosystem code (e.g. a, b, c). Vegetation communities and regional ecosystems are amalgamated into a higher level classification of broad vegetation groups (BVGs).

A published methodology for survey and mapping of regional ecosystems across Queensland (Neldner et al 2017) provides further details on regional ecosystem concepts and terminology.

This report provides information on the type, status, and extent of vegetation communities, regional ecosystems and broad vegetation groups present within a user specified area of interest. Please note, for the purpose of this report, the Biodiversity Status is used. This report has not been developed for application of the *Vegetation Management Act 1999* (VMA). Additionally, information generated in this report has been derived from the Queensland Herbarium's Regional Ecosystem Mapping, and not the regulated mapping certified for the purposes of the VMA. If your interest/matter relates to regional ecosystems and the VMA, users should refer to the Department of Natural Resources, Mines and Energy website.

https://www.dnrme.qld.gov.au/

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

- remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares, or
- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss*, or
- 10-30 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare** regional ecosystem subject to a threatening process.***

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.****

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

**Severe degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example, by loss of A horizon, surface expression of salinity; surface compaction, loss of organic matter or sheet erosion.*

***Rare regional ecosystem: pre-clearing extent (1000 ha); or patch size (100 ha and of limited total extent across its range).*

****Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

*****Moderate degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded.*

2. Remnant Regional Ecosystems

The following table identifies the remnant regional ecosystems and vegetation communities mapped within the AOI and provides their short descriptions, Biodiversity Status, and remnant extent within the selected AOI. Please note, where heterogeneous vegetated patches (mixed patches of remnant vegetation mapped as containing multiple regional ecosystems) occur within the AOI, they have been split and listed as individual regional ecosystems (or vegetation communities where present) for the purposes of the table below. In such instances, associated area figures have been generated based upon the estimated proportion of each regional ecosystem (or vegetation community) predicted to be present within the larger mixed patch.

Table 3: Remnant regional ecosystems, description and status within the AOI

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
12.3.18	Melaleuca irbyana low open forest on alluvial plains	Endangered	23.4	0.21
12.3.19	Eucalyptus moluccana and/or Eucalyptus tereticornis and E. crebra open forest to woodland, with a sparse to mid-dense understorey of Melaleuca irbyana on alluvial plains	Endangered	17.32	0.15
12.3.3	Eucalyptus tereticornis woodland on Quaternary alluvium	Endangered	1.93	0.02
12.3.3d	Eucalyptus tereticornis woodland on Quaternary alluvium	Endangered	10.44	0.09
12.3.7	Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp. fringing woodland	Of concern	67.75	0.6
12.3.8	Swamps with Cyperus spp., Schoenoplectus spp. and Eleocharis spp.	Of concern	76.9	0.69
12.9-10.11	Melaleuca irbyana low open forest on sedimentary rocks	Endangered	26.84	0.24
12.9-10.16	Araucarian microphyll to notophyll vine forest on Cainozoic and Mesozoic sediments	Of concern	6.3	0.06
12.9-10.17	Eucalyptus acmenoides, E. major, E. siderophloia +/- Corymbia citriodora subsp. variegata open fores on sedimentary rocks	No concern at present	6.95	0.06
12.9-10.17a	Eucalyptus acmenoides, E. major, E. siderophloia +/- Corymbia citriodora subsp. variegata open fores on sedimentary rocks	No concern at present	89.12	0.79
12.9-10.2	Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks	No concern at present	570.11	5.08
12.9-10.27	Corymbia citriodora subsp. variegata and/or E. moluccana, E. tereticornis, E. crebra open forest with Melaleuca irbyana understorey on sedimentary rocks	Endangered	68.28	0.61
12.9-10.3	Eucalyptus moluccana open forest on sedimentary rocks	Of concern	15.24	0.14
12.9-10.7	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks	Of concern	196.99	1.76
non-rem	None	None	10,044.05	89.51

Refer to **Map 2** for further information. **Map 3** also provides a visual estimate of the distribution of regional ecosystems present before clearing.

Table 4 provides further information in regards to the remnant regional ecosystems present within the AOI. Specifically, the extent of remnant vegetation remaining within the bioregion, the 1:1,000,000 broad vegetation group (BVG) classification, whether the regional ecosystem is identified as a wetland, and extent of representation in Queensland's Protected Area Estate. For a description of the vegetation communities within the AOI and classified according to the 1:1,000,000 BVG, refer to **Table 6**.

Table 4: Remnant regional ecosystems within the AOI, additional information

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
12.3.18	Pre-clearing 2000 ha; Remnant 2017 100 ha	21b	Palustrine wetland (e.g. vegetated swamp).	No representation
12.3.19	Pre-clearing 3000 ha; Remnant 2017 300 ha	13d	Floodplain (other than floodplain wetlands).	No representation
12.3.3	Pre-clearing 438000 ha; Remnant 2017 40000 ha	16c	Floodplain (other than floodplain wetlands).	Low
12.3.3d	Pre-clearing 438000 ha; Remnant 2017 40000 ha	13d	Floodplain (other than floodplain wetlands).	Low
12.3.7	Pre-clearing 118000 ha; Remnant 2017 60000 ha	16a	Riverine wetland or fringing riverine wetland.	Low
12.3.8	Pre-clearing 7000 ha; Remnant 2017 4000 ha	34c	Palustrine wetland (e.g. vegetated swamp).	Low
12.9-10.11	Pre-clearing 2000 ha; Remnant 2017 200 ha	21b	Palustrine wetland (e.g. vegetated swamp).	No representation
12.9-10.16	Pre-clearing 24000 ha; Remnant 2017 9000 ha	5a	None	High
12.9-10.17	Pre-clearing 65000 ha; Remnant 2017 31000 ha	9a	None	Medium
12.9-10.17a	Pre-clearing 65000 ha; Remnant 2017 31000 ha	28e	None	Medium
12.9-10.2	Pre-clearing 222000 ha; Remnant 2017 87000 ha	10b	None	Low
12.9-10.27	Pre-clearing 5000 ha; Remnant 2017 400 ha	10b	None	No representation
12.9-10.3	Pre-clearing 95000 ha; Remnant 2017 27000 ha	13d	None	Low
12.9-10.7	Pre-clearing 248000 ha; Remnant 2017 41000 ha	13c	None	Low
non-rem	None	None	None	None

Representation in Protected Area Estate: High greater than 10% of pre-clearing extent is represented; Medium 4 - 10% is represented; Low less than 4% is represented, No representation.

The distribution of mapped wetland systems within the area of interest is displayed in **Map 6**.

The following table lists known special values associated with a regional ecosystem type.

Table 5: Remnant regional ecosystems within the AOI, special values

Regional Ecosystem	Special Values
12.3.18	Habitat for listed plant species Melaleuca irbyana and Marsdenia coronata.
12.3.19	Habitat for listed plant species Melaleuca irbyana.
12.3.3	Habitat for threatened plant species including Rhaponticum australe. 12.3.3a: Habitat for threatened plant species including occasional Rhaponticum australe. 12.3.3b: Habitat for threatened flora species including Melaleuca irbyana. 12.3.3c: Habitat for threatened flora species including Melaleuca irbyana and Marsdenia coronata. 12.3.3d: Habitat for threatened plant species including Rhaponticum australe.
12.3.3d	Habitat for threatened plant species including Rhaponticum australe. 12.3.3a: Habitat for threatened plant species including occasional Rhaponticum australe. 12.3.3b: Habitat for threatened flora species including Melaleuca irbyana. 12.3.3c: Habitat for threatened flora species including Melaleuca irbyana and Marsdenia coronata. 12.3.3d: Habitat for threatened plant species including Rhaponticum australe.
12.3.7	Habitat for an extensive range of aquatic flora and fauna.
12.3.8	Provides wetland habitat for a plant and fauna. 12.3.8a: Provides wetland habitat for a plant and fauna.
12.9-10.11	Habitat for threatened plant species including Melaleuca irbyana. 12.9-10.11a: Habitat for threatened flora species including Melaleuca irbyana.
12.9-10.16	Habitat for threatened plant species including Alectryon ramiflorus, Planchonella eerwah, Plectranthus omissus, Sarcochilus weinthalii, Cupaniopsis shirleyana, C. tomentella and near threatened species including Hernandia bivalvis.
12.9-10.17	Potential habitat for NCA listed species: Acacia acrionastes, Arundinella grevillensis, Cupaniopsis tomentella, Gonocarpus hirtus, Grevillea linsmithii, Leionema obtusifolium, Macrozamia pauli-guilielmi, Marsdenia coronata, Marsdenia longiloba, Notelaea l
12.9-10.17a	Potential habitat for NCA listed species: Acacia acrionastes, Arundinella grevillensis, Cupaniopsis tomentella, Gonocarpus hirtus, Grevillea linsmithii, Leionema obtusifolium, Macrozamia pauli-guilielmi, Marsdenia coronata, Marsdenia longiloba, Notelaea l
12.9-10.2	Habitat for threatened plant species including Notelaea lloydii, Grevillea quadricauda, Westringia sericea, Plectranthus habrophyllus
12.9-10.27	Habitat for listed plant species Melaleuca irbyana.
12.9-10.3	Potential habitat for NCA listed species: Callitris baileyi, Haloragis exalata subsp. velutina, Picris conyzoides, Sophora fraseri
12.9-10.7	Potential habitat for NCA listed species: Callitris baileyi, Graptophyllum reticulatum, Melaleuca formosa, Melaleuca irbyana, Paspalidium grandispiculatum, Plectranthus habrophyllus, Polianthion minutiflorum, Zieria inexpectata
non-rem	None

3. Remnant Regional Ecosystems by Broad Vegetation Group

BVGs are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid climatic zones. BVGs provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states. There are three levels of BVGs which reflect the approximate scale at which they are designed to be used: the 1:5,000,000 (national), 1:2,000,000 (state) and 1:1,000,000 (regional)

scales.

A comprehensive description of BVGs is available at:

https://publications.qld.gov.au/dataset/redd/resource/

The following table provides a description of the 1:1,000,000 BVGs present and their associated extent within the AOI.

Table 6: Broad vegetation groups (1 million) within the AOI

BVG (1 Million)	Description	Area (Ha)	% of AOI
None	None	10,044.05	89.51
10b	Moist open forests to woodlands dominated by Corymbia citriodora (spotted gum). (land zones 12, 11, 9, 5, 8) (SEQ, CQC, EIU, WET)	638.39	5.69
13c	Woodlands of Eucalyptus crebra (sens. lat.) (narrow-leaved red ironbark), E. drepanophylla (grey ironbark), E. fibrosa (dusky-leaved ironbark), E. shirleyi (shirley's silver-leaved ironbark) on granitic and metamorphic ranges (land zones 12, 11, 9, [5]) (BRB, EIU, SEQ, NET, CQC)	196.99	1.76
13d	Woodlands dominated by Eucalyptus moluccana (gum-topped box) (or E. microcarpa (inland grey box)) on a range of substrates. (land zone 5, 9, 3, 11, 12) (BRB, SEQ, EIU, CQC, [NET, WET])	42.99	0.38
16a	Open forest and woodlands dominated by Eucalyptus camaldulensis (river red gum) (or E. tereticornis (blue gum)) and/or E. coolabah (coolabah) (or E. microtheca (coolabah)) fringing drainage lines. Associated species may include Melaleuca spp., Corymbia tessellaris (carbeen), Angophora spp., Casuarina cunninghamiana (riveroak). Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (MGD, BRB, GUP, CHC, MUL, DEU, EIU, NWH, SEQ, [NET, WET]) (All bioregions except CYP and CQC)	67.75	0.6
16c	Woodlands and open woodlands dominated by Eucalyptus coolabah (coolabah) or E. microtheca (coolabah) or E. largiflorens (black box) or E. tereticornis (blue gum) or E. chlorophylla on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (All bioregions except WET, principally GUP, BRB, MUL).	1.93	0.02
21b	Low open woodlands and tall shrublands of Melaleuca citrolens or M. stenostachya or other Melaleuca spp. (land zones 5, 3, 7, 10, 11, 12) (GUP, CYP, EIU, DEU, BRB, [SEQ])	50.25	0.45
28e	Low open forest to woodlands dominated by Lophostemon suaveolens (swamp box) (or L. confertus (brush box)) or Syncarpia glomulifera (turpentine) frequently with Allocasuarina spp. on rocky hill slopes. (land zones 12, 9, 3, 11, [10, 8]) (CQC, WET, SEQ, BRB, [CYP])	89.12	0.79
34c	Palustrine wetlands. Freshwater swamps on coastal floodplains dominated by sedges and grasses such as Oryza spp., Eleocharis spp. (spikerush) or Baloskion spp. (cord rush) / Leptocarpus tenax / Gahnia sieberiana (sword grass) / Lepironia spp. (land zones 3, 2, [1]) (CYP, GUP, BRB, SEQ, WET, [CQC])	76.9	0.69
5a	Araucarian notophyll/microphyll and microphyll vine forests of southern coastal bioregions. (land zones 8, 11, 5, 9) (SEQ)	6.3	0.06

BVG (1 Million)	Description	Area (Ha)	% of AOI
9a	Moist to dry eucalypt open forests to woodlands, dominated by a variety of species including Eucalyptus acmenoides (narrow-leaved white stringybark), E. carnea (broad-leaved white mahogany), E. propinqua (small-fruited grey gum), E. siderophloia (red ironbark), E. tindaliae (Queensland white stringybark), E. racemosa, Corymbia intermedia (pink bloodwood), C. trachyphloia (yellow bloodwood), E. planchoniana (Planchon's stringybark), E. baileyana (Bailey's stringybark), E. moluccana (gum-topped box) and Angophora leiocarpa (rusty gum). (land zones 11, 9-10, 8, 12, 5, 3) (SEQ).	6.95	0.06

Refer to **Map 4** for further information. **Map 5** also provides a representation of the distribution of vegetation communities as per the 1:5,000,000 BVG believed to be present prior to European settlement.

4. Technical and BioCondition Benchmark Descriptions

Technical descriptions provide a detailed description of the full range in structure and floristic composition of regional ecosystems (e.g. 11.3.1) and their component vegetation communities (e.g. 11.3.1a, 11.3.1b). See:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

The descriptions are compiled using site survey data from the Queensland Herbarium's CORVEG database. Distribution maps, representative images (if available) and the pre-clearing and remnant extent (hectares) of each vegetation community derived from the regional ecosystem mapping data are included. The technical descriptions should be used in conjunction with the fields from the regional ecosystem description database (REDD) for a full description of the regional ecosystem.

Technical descriptions include data on canopy height, canopy cover and native plant species composition of the predominant layer, which are attributes relevant to assessment of the remnant status of vegetation under the *Vegetation Management Act 1999*. However, as technical descriptions reflect the full range in structure and floristic composition across the climatic, natural disturbance and geographic range of the regional ecosystem, local reference sites should be used for remnant assessment where possible (Neldner et al. 2012 (PDF)* section 3.3.1 of:

https://publications.qld.gov.au/dataset/redd/resource/

The technical descriptions are subject to review and are updated as additional data becomes available.

When conducting a BioCondition assessment, these technical descriptions should be used in conjunction with BioCondition benchmarks for the specific regional ecosystem, or component vegetation community.

http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance regimes has been considered throughout the geographic extent of the regional ecosystem. Local reference sites should be used for this spatial and temporal (seasonal and annual) variability.

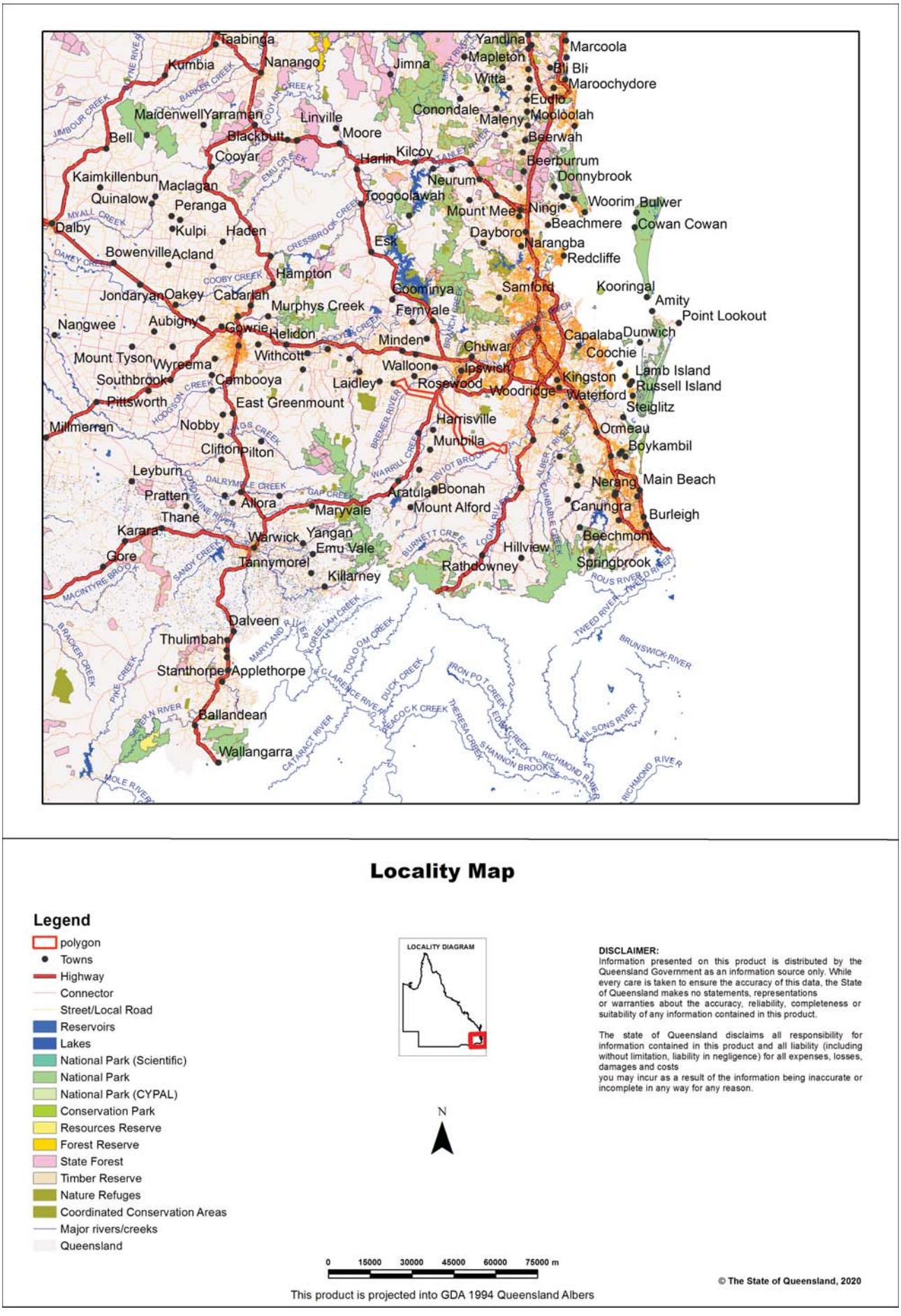
Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available

Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
12.3.18	Not currently available	Not currently available
12.3.19	Not currently available	Not currently available
12.3.3	Available	Not currently available
12.3.3d	Available	Not currently available
12.3.7	Available	Not currently available
12.3.8	Not currently available	Not currently available

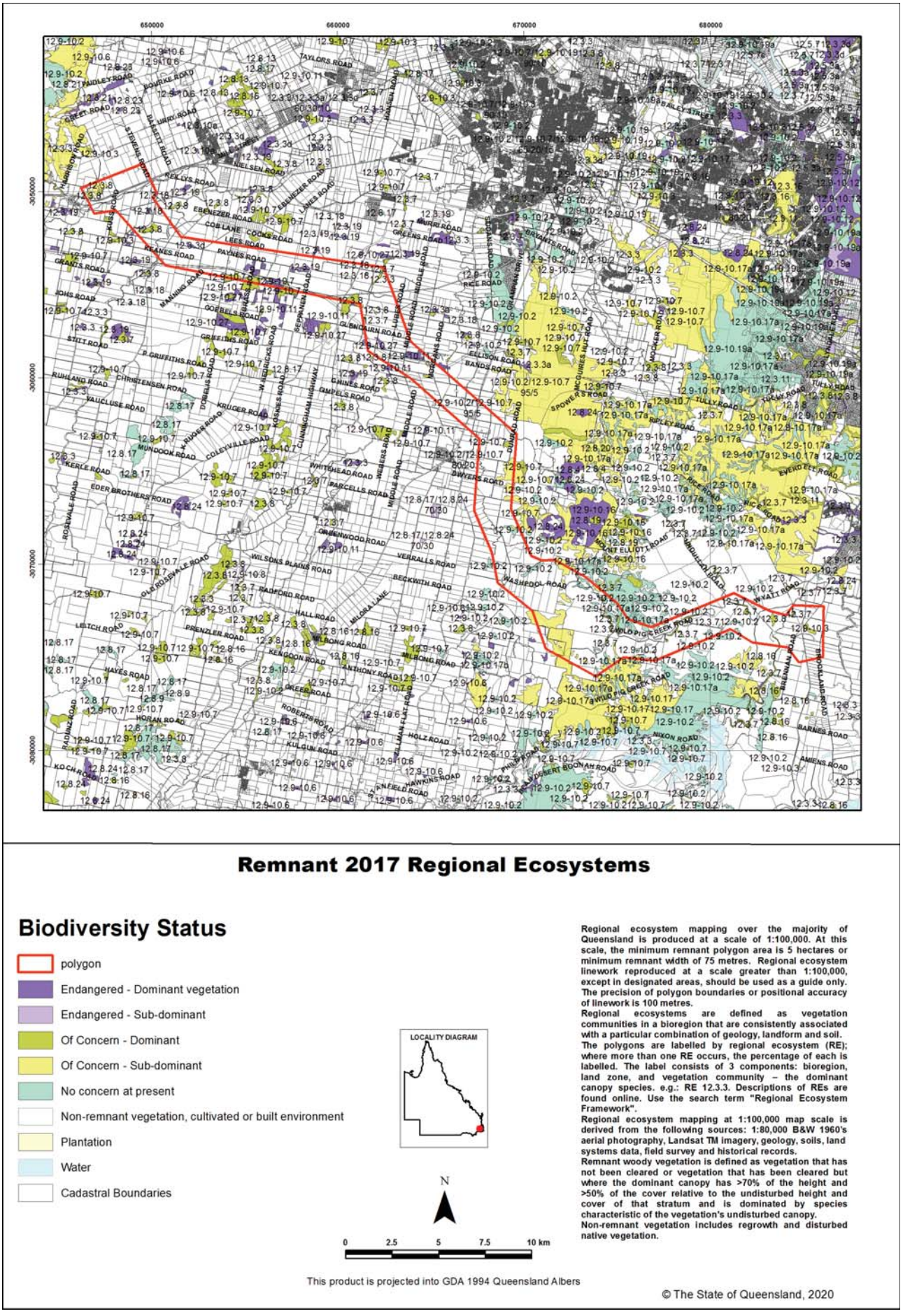
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
12.9-10.11	Not currently available	Not currently available
12.9-10.16	Not currently available	Not currently available
12.9-10.17	Not currently available	Not currently available
12.9-10.17a	Not currently available	Not currently available
12.9-10.2	Available	Not currently available
12.9-10.27	Not currently available	Not currently available
12.9-10.3	Available	Not currently available
12.9-10.7	Available	Not currently available
non-rem	Not currently available	Not currently available

Maps

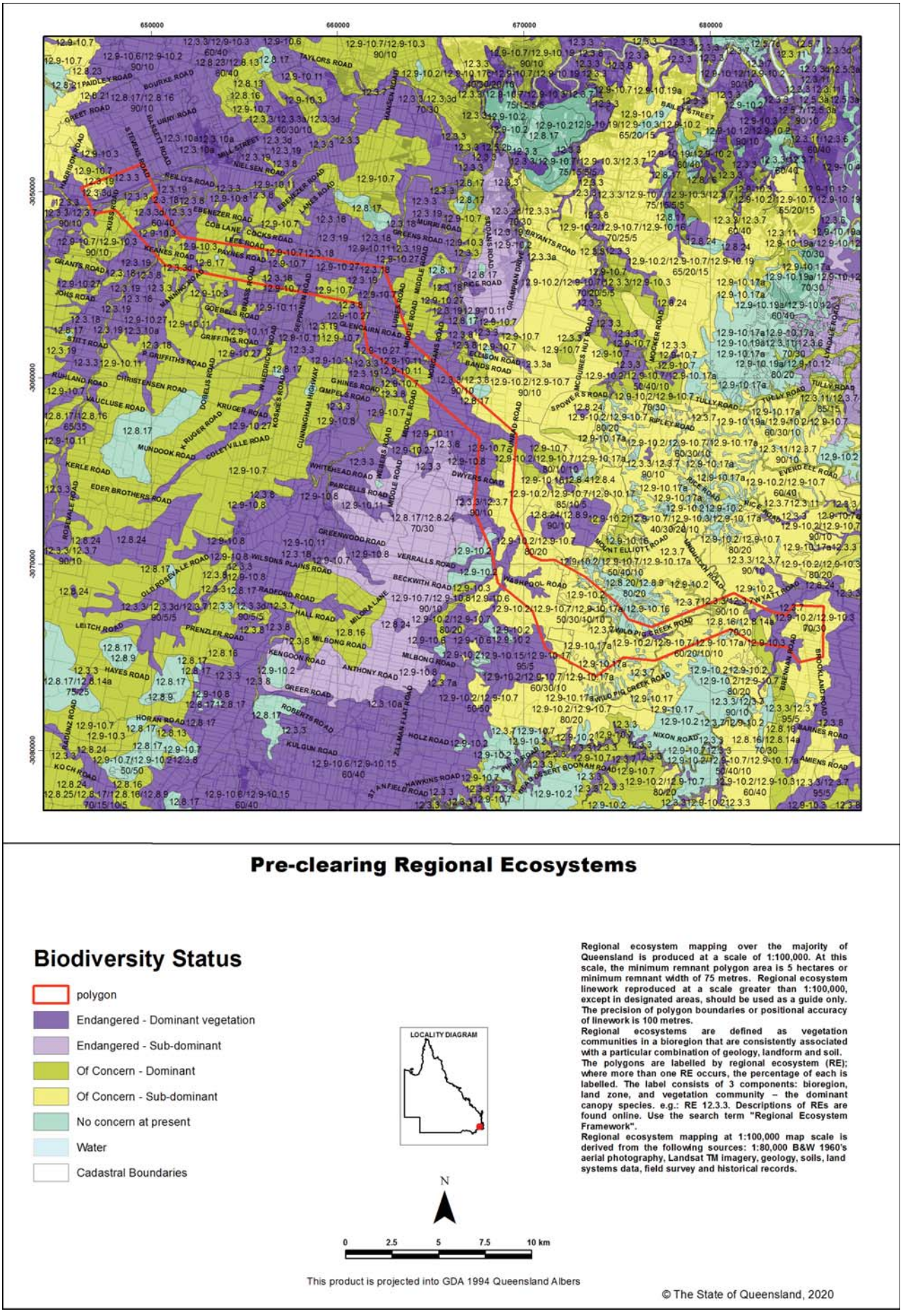
Map 1 - Location



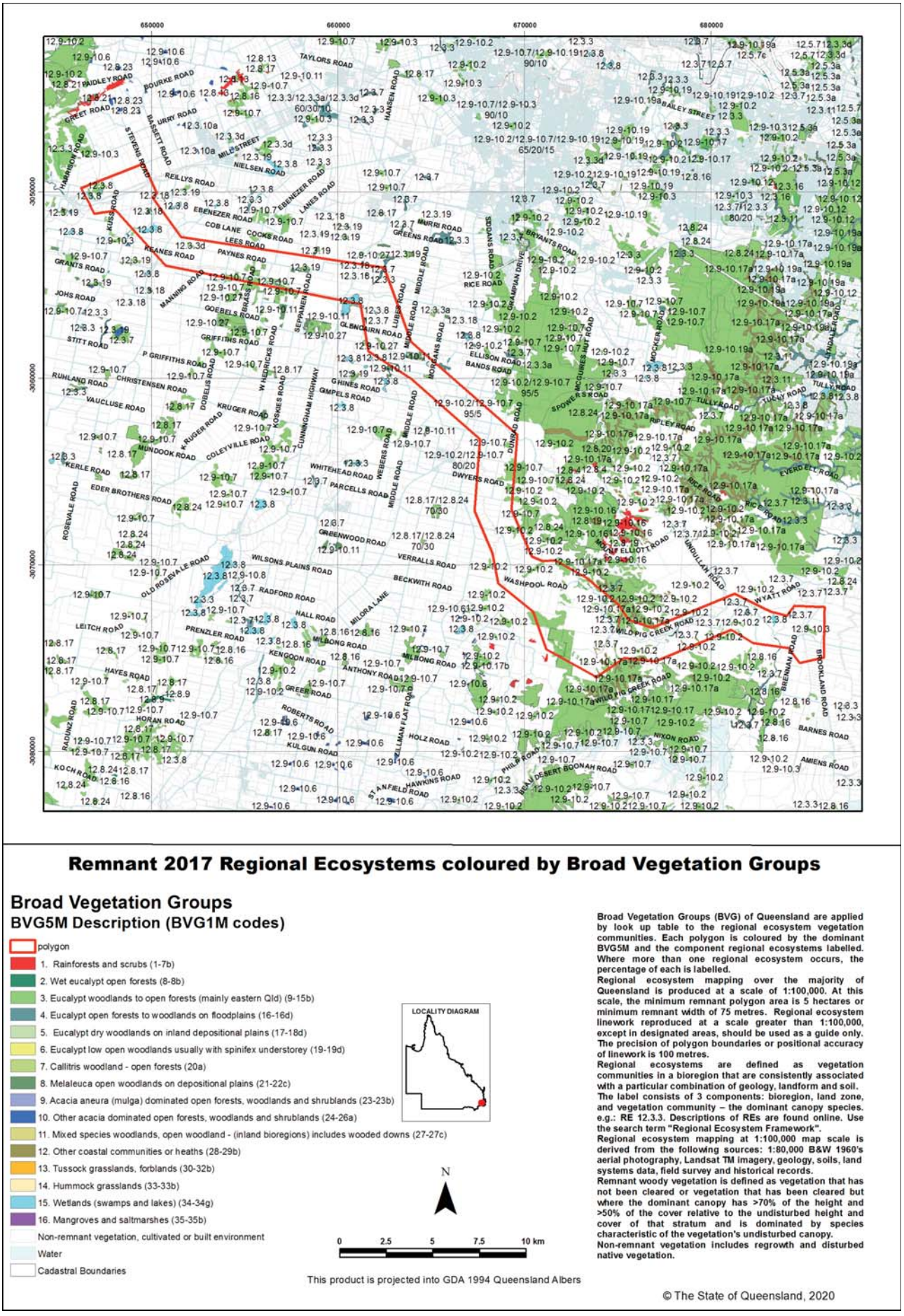
Map 2 - Remnant 2017 regional ecosystems



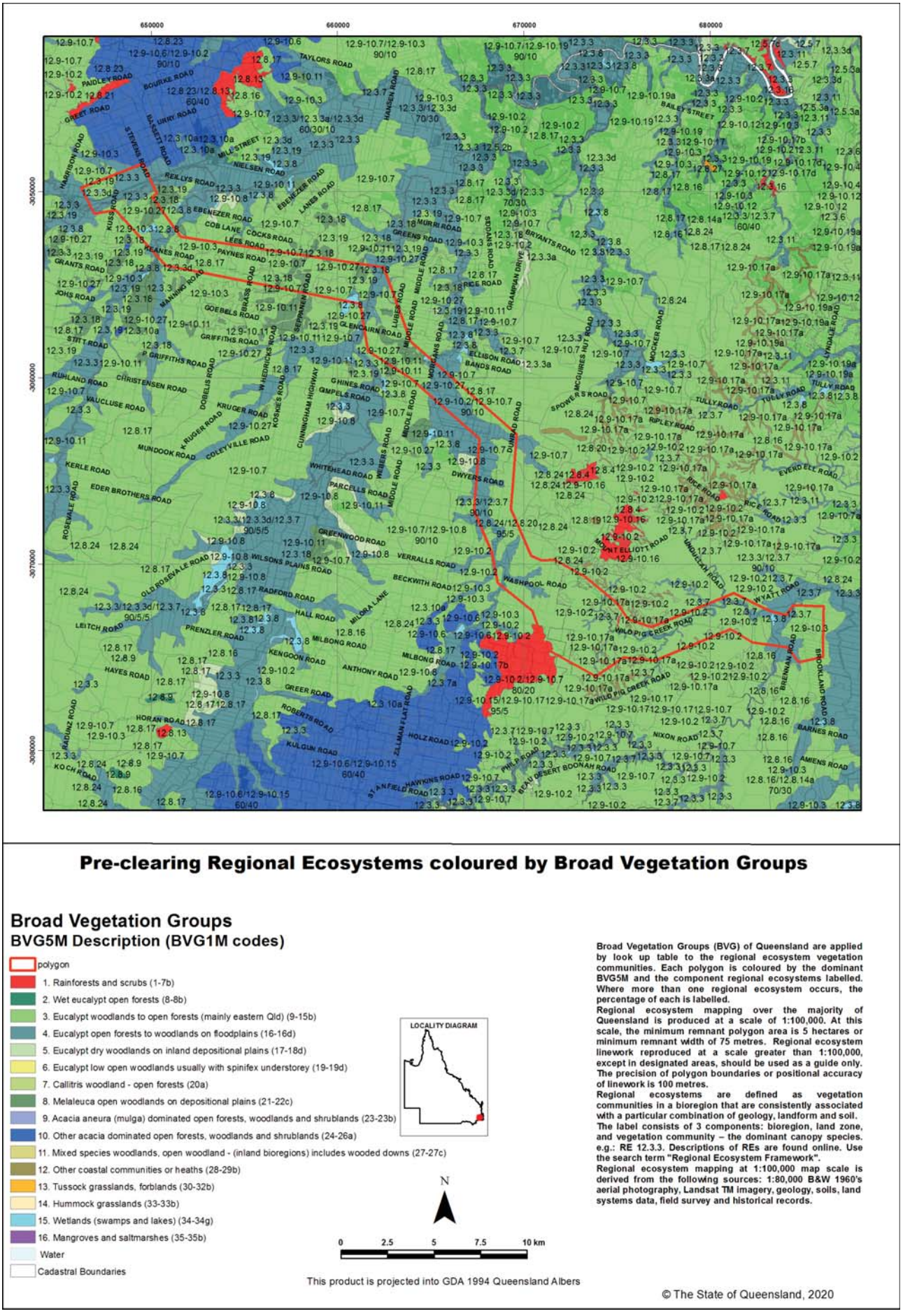
Map 3 - Pre-clearing regional ecosystems



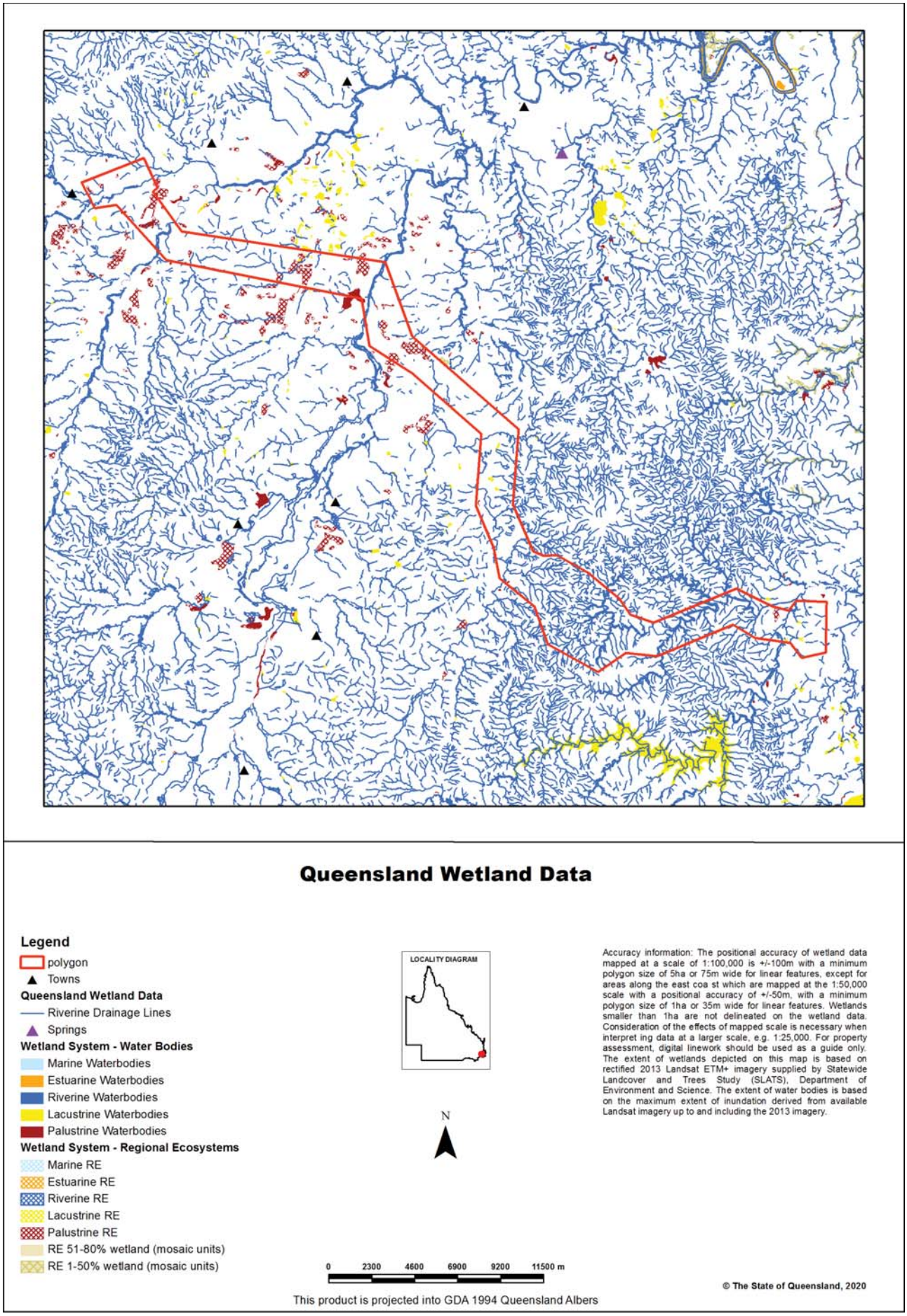
Map 4 - Remnant 2017 regional ecosystems by BVG (5M)



Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Map 6 - Wetlands and waterways



Links and Other Information Sources

The Department of Environment and Science's Website -

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from:

https://publications.qld.gov.au/dataset/redd/resource/

The methodology for mapping regional ecosystems can be downloaded from:

https://publications.qld.gov.au/dataset/redd/resource/

Technical descriptions for regional ecosystems can be obtained from:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

Benchmarks can be obtained from:

http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

For further information associated with the remnant regional ecosystem dataset used by this report, refer to the metadata associated with the Biodiversity status of pre-clearing and Remnant Regional Ecosystems of Queensland dataset (version listed in **Appendix 1**) which is available through the Queensland Government Information System portal,

http://dds.information.qld.gov.au/dds/

The Queensland Globe is a mapping and data application. As an interactive online tool, Queensland Globe allows you to view and explore Queensland maps, imagery (including up-to-date satellite images) and other spatial data, including regional ecosystem mapping. To further view and explore regional ecosystems over an area of interest, access the Biota Globe (a component of the Queensland Globe). The Queensland Globe can be accessed via the following link:

http://www.dnrm.qld.gov.au/mapping-data/queensland-globe

References

Neldner, V.J., Niehus R.E., Wilson, B.A. McDonald, W.J.F., Ford, A.J. and Accad, A. (2017) The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 3.0. Queensland Herbarium, Department of Science, Information Technology, Innovation and the Arts.

(https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086)

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S. and Butler, D.W. (2017) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 4.0. Queensland Herbarium, Department of Science, Information Technology, Innovation and the Arts.

(https://publications.qld.gov.au/dataset/redd/resource/6dee78ab-c12c-4692-9842-b7257c2511e4)

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendices

Appendix 1 - Source Data

The dataset listed below is available for download from:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/

- Regional Ecosystem Description Database

The datasets listed below are available for download from:

http://dds.information.qld.gov.au/dds/

- Biodiversity status of pre-clearing and 2017 remnant regional ecosystems of Queensland
- Pre-clearing Vegetation Communities and Regional Ecosystems of Queensland
- Queensland Wetland Data Version - Wetland lines
- Queensland Wetland Data Version - Wetland points
- Queensland Wetland Data Version - Wetland areas

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
VMA	- *Vegetation Management Act 1999*

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix E Flora Species List

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Flora species recorded during Autumn 2016 GHD and Spring 2017 FFJV field assessments undertaken as part of the project EIS

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Acanthaceae	*Rostellularia adscendens*	Pink tongues	LC	-	Native	-
Adiantacae	*Adiantum hispidulum*	Rough maidenhair fern	SLC	-	Native	-
Adiantaceae	*Cheilanthes sieberi subsp. sieberi*	Rock fern	SLC	-	Native	-
Amaranthaceae	*Achyranthes aspera*	Chaff flower	LC	-	Native	-
Amaranthaceae	*Alteranthera pungens*	Kakhi weed	-	-	Non-native	-
Amaranthaceae	*Alternanthera denticulata*	Lesser joyweed	LC	-	Native	-
Amaranthaceae	*Gomphrena celosioides*	Gomphrena weed	-	-	Non-native	-
Anthericaceae	*Tricoryne elatior*	Yellow autumn-lily	LC	-	Native	-
Apocynaceae	*Alstonia constricta*	Bitterbark	LC	-	Native	-
Apocynaceae	*Alyxia ruscifolia*	Chainfruit	LC	-	Native	-
Apocynaceae	*Asclepias curassavica*	Red-head cottonbush	-	-	Non-native	-
Apocynaceae	*Carissa ovata*	Currantbush	LC	-	Native	-
Apocynaceae	*Gomphocarpus fruticosus*	Swan plant	-	-	Non-native	-
Apocynaceae	*Gomphocarpus physocarpus*	Balloon cottonbush	-	-	Non-native	-
Apocynaceae	*Hoya australis subsp. australis*	Wax flower	LC	-	Native	-
Apocynaceae	*Parsonsia straminea*	Monkey rope	LC	-	Native	-
Apocynaceae	*Secamone elliptica*	Corky milk vinw	LC	-	Native	-
Araucariaceae	*Araucaria cunninghamiana (planted)*	Hoop pine	LC	-	Native	-
Aristolochiaceae	*Aristolochia elegans*	Dutchman's pipe	-	-	Non-native	Category 3
Asparagaceae	*Asparagus africanus*	Asparagus fern	-	-	Non-native	Category 3
Asteraceae	*Ageratina riparia*	Mist flower	-	-	Non-native	-
Asteraceae	*Ageratum houstonianum*	Blue billygoat weed	-	-	Non-native	-
Asteraceae	*Ambrosia artemisiifolia*	Annual ragweed	-	-	Non-native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Asteraceae	*Aster subulatus*	Wild aster	-	-	Non-native	-
Asteraceae	*Baccharis halimifolia*	Groundsel bush	-	-	Non-native	Category 3
Asteraceae	*Bidens pilosa*	Cobbler's peg	-	-	Non-native	-
Asteraceae	*Centipeda minima*	Spreading sneezeweed	LC	-	Native	-
Asteraceae	*Chrysocephalum apiculatum*	Yellow buttons	LC	-	Native	-
Asteraceae	*Cirsium vulgare*	Spear thistle	-	-	Non-native	-
Asteraceae	*Erigeron bonariensis*	Flaxleaf fleabane	-	-	Non-native	-
Asteraceae	*Erigeron parva*	-	-	-	Non-native	-
Asteraceae	*Erigeron sumatrensis*	-	-	-	Non-native	-
Asteraceae	*Cyanthillium cinereum*	Veronia	LC	-	Native	-
Asteraceae	*Emilia sonchifolia*	Lilac tasselflower	-	-	Non-native	-
Asteraceae	*Hypochaeris glabra*	Cat's ear	-	-	Non-native	-
Asteraceae	*Ozothamnus diosmifolius*	White dogwood	LC	-	Native	-
Asteraceae	*Parthenium hysterophorus*	Parthenium weed	-	-	Non-native	Category 3
Asteraceae	*Pterocaulon redolens*	A herb	LC	-	Native	-
Asteraceae	*Senecio madagascariensis*	Fireweed	-	-	Non-native	Category 3
Asteraceae	*Sonchus oleraceus*	Sow thistle	-	-	Non-native	-
Asteraceae	*Tagetes minuta*	Stinking roger	-	-	Non-native	-
Asteraceae	*Tridax procumbens*	Tridax	-	-	Non-native	-
Asteraceae	*Vittadinia dissecta*	-	LC	-	Native	-
Asteraceae	*Xanthium occidentale*	Noogoora burr	-	-	Non-native	-
Asteraceae	*Zinnia peruviana*	Peruvian zinia	-	-	Non-native	-
Bignoniaceae	*Pandorea pandorana*	Wonga wonga vine	LC	-	Native	-
Boraginaceae	*Heliotropium amplexicaule*	Blue heliotrope	-	-	Non-native	-
Cactaceae	*Opuntia stricta*	Common prickly pear	-	-	Non-native	Category 3
Cactaceae	*Opuntia tomentosa*	Velvety tree pear	-	-	Non-native	Category 3

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Caesalpiniaceae	*Chamaecrista rotundifolia*	Round-leafed cassia	-	-	Non-native	-
Campanulaceae	*Lobelia purpurascens*	White root	SLC	-	Native	-
Campanulaceae	*Wahlenbergia gracilis*	Sprawling bluebell	SLC	-	Native	-
Casuarinaceae	*Allocasuarina littoralis*	Black she-oak	LC	-	Native	-
Casuarinaceae	*Allocasuarina sp*	Shoak	LC	-	Native	-
Casuarinaceae	*Allocasuarina torulosa*	Mountain oak	LC	-	Native	-
Casuarinaceae	*Casuarina cunninghamiana*	River she-oak	LC	-	Native	-
Chenopodiaceae	*Einadia nutans*	Climbing saltbush	LC	-	Native	-
Chenopodiaceae	*Enchylaena tomentosa*	Ruby saltbush	LC	-	Native	-
Chenopodiaceae	*Maireana microphylla*	Small-leaf bluebush	LC	-	Native	-
Chenopodiaceae	*Sclerolaena muricata*	Black roly-poly	LC	-	Native	-
Commelinaceae	*Commelina diffusa*	Wandering jew	LC	-	Native	-
Commelinaceae	*Murdannia graminea*	Grass lily	LC	-	Native	-
Convolvulaceae	*Dichondra repens*	Kidney weed	LC	-	Native	-
Convolvulaceae	*Evolvulus alsinoides*	Slender dwarf morning-glory	LC	-	Native	-
Convolvulaceae	*Ipomoea cairica*	Coastal morning glory	-	-	Non-native	-
Crassulaceae	*Bryophyllum delagoense*	Mother of millions	-	-	Non-native	Category 3
Cyperaceae	*Carex appressa*	Tall sedge	LC	-	Native	-
Cyperaceae	*CyperXV sp*	Sedge	LC	-	Native	-
Cyperaceae	*Cyperus bifax*	Nutgrass	LC	-	Native	-
Cyperaceae	*Cyperus difformis*	Dirty dora	LC	-	Native	-
Cyperaceae	*Cyperus exaltatus*	Tall flatsedge	LC	-	Native	-
Cyperaceae	*Cyperus gracilis*	Slender flat-sedge	LC	-	Native	-
Cyperaceae	*Cyperus polystachyos*	Bunchy sedge	LC	-	Native	-
Cyperaceae	*Cyperus trinervis*	Flatsedge	LC	-	Native	-
Cyperaceae	*Eleocharis cylindrostachys*	-	LC	-	Native	-
Cyperaceae	*Fimbristylis dichotoma*	Common fringe-rush	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Cyperaceae	*Gahnia aspera*	Rough saw-sedge	LC	-	Native	-
Cyperaceae	*Lepironia articulata*	Grey rush	LC	-	Native	-
Dennstaedtiaceae	*Pteridium esculentum*	Common bracken	LC	-	Native	-
Euphorbiaceae	*Alchornea ilicifolia*	Native holly	LC	-	Native	-
Euphorbiaceae	*Euphorbia hirta*	Asthma weed	-	-	Non-native	-
Euphorbiaceae	*Homalanthus stillingiifolius*	Small-leaved bleeding heart	LC	-	Native	-
Euphorbiaceae	*Mallotus philippensis*	Red kamala	LC	-	Native	-
Euphorbiaceae	*Ricinus communis*	Castor oil bush	-	-	Non-native	-
Fabacae	*Crotalaria mitchellii*	Yellow rattlepod	LC	-	Native	-
Fabacae	*Jacksonia scoparia*	Dogwood	LC	-	Native	-
Fabacae	*Macroptilium lathyroides*	Phasey bean	-	-	Non-native	-
Fabacae	*Rhynchosia minima*	Rhynchosia	LC	-	Native	-
Fabacae	*Stylosanthes scabra*	Stylo	-	-	Non-native	-
Fabaceae	*Desmodium rhytidophyllum*	Hairy trefoil	LC	-	Native	-
Fabaceae	*Glycine tabacina*	Glycine pea	LC	-	Native	-
Fabaceae	*Hardenbergia violacea*	Purple coral pea	LC	-	Native	-
Fabaceae	*Macroptilium atropurpureum*	Siratro	-	-	Non-native	-
Fabaceae	*Macroptilium lathyroides var. semierectum*	Cow pea	-	-	Non-native	-
Fabaceae	*Medicago polymorpha*	Burr medic	-	-	Non-native	-
Fabaceae	*Rhynchosia minima var. minima*	Least snout-bean	LC	-	Native	-
Goodeniaceae	*Goodenia hederacea*	Forest goodenia	LC	-	Native	-
Hemerocallidaceae	*Dianella brevipedunculata*	Blue flax lily	LC	-	Native	-
Hemerocallidaceae	*Dianella caerulea*	Blue flax lily	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Hemerocallidaceae	*Dianella revoluta*	Blue flax lily	LC	-	Native	-
Hypericaceae	*Hypericum gramineum*	Small St. John's wort	LC	-	Native	-
Juncaceae	*Juncus continuus*	A rush	LC	-	Native	-
Juncaceae	*Juncus usitatus*	-	LC	-	Native	-
Lamiaceae	*Plectranthus sp.*	-	-	-	Non-native	-
Lauraceae	*Cinnamomum camphora*	Camphor laurel	-	-	Non-native	-
Lauraceae	*Cassytha pubescens*	Downy devil's twine	LC	-	Native	-
Lauraceae	*Neolitsea dealbata*	Bolly gum	LC	-	Native	-
Laxmanniaceae	*Eustrephus latifolius*	Wombat berry	LC	-	Native	-
Laxmanniaceae	*Laxmannia gracilis*	Slender wire lily	LC	-	Native	-
Laxmanniaceae	*Lomandra filiformis*	Wattle matrush	LC	-	Native	-
Laxmanniaceae	*Lomandra hystrix*	-	LC	-	Native	-
Laxmanniaceae	*Lomandra longifolia*	Spiny-head mat-rush	LC	-	Native	-
Laxmanniaceae	*Lomandra multiflora subsp. multiflora*	Many-flowered mat-rush	LC	-	Native	-
Loranthaceae	*Amyema miquelii*	Box mistletoe	LC	-	Native	-
Malvaceae	*Malvastrum americanum var. americanum*	Spiked malvastrum	LC	-	Native	-
Malvaceae	*Sida cordifolia*	Flannelweed	-	-	Non-native	-
Malvaceae	*Sida hackettiana*	Golden rod	LC	-	Native	-
Marsileaceae	*Marsilea drummondii*	Common nardoo	LC	-	Native	-
Marsileaceae	*Marsilea hirsuta*	Hairy nardoo	LC	-	Native	-
Meliaceae	*Melia azedarach*	White cedar	LC	-	Native	-
Menyanthaceae	*Nymphoides indica*	Water snowflake	LC	-	Native	-
Mimosaceae	*Acacia complanata*	Flat-stemmed wattle	LC	-	Native	-
Mimosaceae	*Acacia concurrens*	Black wattle	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Mimosaceae	*Acacia disparrima*	Hickory wattle	LC	-	Native	-
Mimosaceae	*Acacia fimbriata*	Fringed wattle	LC	-	Native	-
Mimosaceae	*Acacia harpophlylla*	Brigalow	LC	-	Native	-
Mimosaceae	*Acacia leiocalyx*	Black wattle	LC	-	Native	-
Mimosaceae	*Acacia maidenii*	Maiden's wattle	LC	-	Native	-
Mimosaceae	*Acacia salicina*	Doolan	LC	-	Native	-
Mimosaceae	*Acacia sp*	Wattle	LC	-	Native	-
Mimosaceae	*Leucaena leucocephala*	Leucaena	-	-	Non-native	-
Mimosaceae	*Neptunia gracilis*	Native sensitive plant	LC	-	Native	-
Mimosaceae	*Vachellia farnesiana*	Mimosa bush	-	-	Non-native	-
Moraceae	*Ficus opposita*	Sandpaper fig	LC	-	Native	-
Moraceae	*Ficus rubiginosa*	Rusty fig	LC	-	Native	-
Moraceae	*Ficus rubiginosa forma rubiginosa*	Port Jackson fig	LC	-	Native	-
Moraceae	*Maclura cochinchinensis*	Cockspur thorn	LC	-	Native	-
Moraceae	*Streblus brunonianus*	Whalebone tree	LC	-	Native	-
Myrtaceae	*Angophora subvelutina*	Broadleaf apple	LC	-	Native	-
Myrtaceae	*Corymbia citriodora subsp. citriodora*	Spotted gum	LC	-	Native	-
Myrtaceae	*Corymbia citriodora subsp. variegata*	Spotted gum	LC	-	Native	-
Myrtaceae	*Corymbia intermedia*	Pink bloodwood	LC	-	Native	-
Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash	LC	-	Native	-
Myrtaceae	*Eucalyptus acmenoides*	White mahogany	LC	-	Native	-
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved red ironbark	LC	-	Native	-
Myrtaceae	*Eucalyptus grandis (planted)*	Flooded gum	LC	-	Native	-
Myrtaceae	*Eucalyptus moluccana*	Gum-topped box	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Myrtaceae	*Eucalyptus siderophloia*	Grey ironbark	LC	-	Native	-
Myrtaceae	*Eucalyptus tereticornis*	Queensland bluegum	LC	-	Native	-
Myrtaceae	*Eucalytpus melanophloia*	Silver-leaved ironbark	LC	-	Native	-
Myrtaceae	*Lophostemon confertus*	Brush box	LC	-	Native	-
Myrtaceae	*Lophostemon suaveolens*	Swamp box	LC	-	Native	-
Myrtaceae	*Melaleuca irbyana*	Swamp tea-tree	E	-	Native	-
Myrtaceae	*Melaleuca viminalis*	Weeping bottlebrush	LC	-	Native	-
Nymphaeaceae	*Nymphaea gigantea*	Giant waterlily	LC	-	Native	-
Oleaceae	*Jasminum didymum subsp. didymum*	Jasmine	LC	-	Native	-
Oleaceae	*Jasminum simplicifolium*	Native jasmine	LC	-	Native	-
Oleaceae	*Jasminum simplicifolium subsp. australiense*	Stiff jasmine	LC	-	Native	-
Oleaceae	*Notelaea lloydii*	Loyd's native olive	V	V	Native	-
Oleaceae	*Notelaea longifolia*	Large-leaved olive	LC	-	Native	-
Oleaceae	*Notelaea microcarpa*	Native olive	LC	-	Native	-
Onagraceae	*Ludwigia peploides subsp. montevidensis*	Water primrose	LC	-	Native	-
Orchidaceae	*Cymbidium canaliculatum*	Black orchid	SLC	-	Native	-
Orchidaceae	*Dockrillia linguiformis*	Tongue orchid	SLC	-	Native	-
Oxalidaceae	*Oxalis perennans*	Native oxalis	LC	-	Native	-
Passifloraceae	*Passiflora suberosa*	Corky passion flower	-	-	Non-native	-
Philydraceae	*Philydrum lanuginosum*	Wooly frogmouth	LC	-	Native	-
Phyllanthaceae	*Breynia oblongifolia*	Coffee bush	LC	-	Native	-
Picrodendraceae	*Petalostigma pubescens*	Quinine tree	LC	-	Native	-
Pittosporaceae	*Bursaria spinosa*	Sweet bursaria	LC	-	Native	-
Poaceae	*Ancistrachne uncinulata*	Hooky grass	LC	-	Native	-
Poaceae	*Aristida calycina*	Dark wiregrass	LC	-	Native	-
Poaceae	*Aristida holathera*	Erect kerosene grass	LC	-	Native	-
Poaceae	*Aristida personata*	Purple wiregrass	LC	-	Native	-
Poaceae	*Aristida sp*	Wiregrass	LC	-	Native	-
Poaceae	*Aristida vagans*	Threeawn speargrass	LC	-	Native	-
Poaceae	*Austrostipa ramosissima*	Stout bamboo grass	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Poaceae	*Bothriochloa decipens*	Pitted bluegrass	LC	-	Native	-
Poaceae	*Cenchrus ciliaris*	Buffle grass	-	-	Non-native	-
Poaceae	*Chloris divaricata*	Slender chloris	LC	-	Native	-
Poaceae	*Chloris gayana*	Rhodes grass	-	-	Non-native	-
Poaceae	*Chloris truncata*	Windmill grass	LC	-	Native	-
Poaceae	*Chloris ventricosa*	Tall chloris	LC	-	Native	-
Poaceae	*Cymbopogon refractus*	Barbed-wire grass	LC	-	Native	-
Poaceae	*Cynodon dactylon*	Green couch	LC	-	Native	-
Poaceae	*Dichanthium aristatum*	Angelton grass	-	-	Non-native	-
Poaceae	*Dichanthium sericeum*	Queensland bluegrass	LC	-	Native	-
Poaceae	*Dinebra decipiens var. decipiens*	A grass	LC	-	Native	-
Poaceae	*Eleusine indica*	Goose grass	-	-	Non-native	-
Poaceae	*Eragrostis brownii*	Brown's lovegrass	LC	-	Native	-
Poaceae	*Eragrostis elongata*	Clustered lovegrass	LC	-	Native	-
Poaceae	*Eragrostis sororia*	-	LC	-	Native	-
Poaceae	*Heteropogon contortus*	Black speargrass	LC	-	Native	-
Poaceae	*Imperata cylindrica*	Blady grass	LC	-	Native	-
Poaceae	*Leersia hexandra*	Swamp ricegrass	LC	-	Native	-
Poaceae	*Leptochloa digitata*	Umbrella canegrass	LC	-	Native	-
Poaceae	*Megathyrsus maximus*	Guinea grass	-	-	Non-native	-
Poaceae	*Megathyrsus maximus var. maximus*	Guinea grass	-	-	Non-native	-
Poaceae	*Melinis repens*	Red natal grass	-	-	Non-native	-
Poaceae	*Oplismenus aemulus*	Creeping shade grass	LC	-	Native	-
Poaceae	*Panicum decompositum var. decompositum*	Native millet	LC	-	Native	-
Poaceae	*Panicum effusum*	Hairy panic	LC	-	Native	-
Poaceae	*Panicum queenlandicum*	Coolabah grass	LC	-	Native	-
Poaceae	*Panicum simile*	-	LC	-	Native	-
Poaceae	*Paspalidium caespitosum*	Brigalow grass	LC	-	Native	-
Poaceae	*Paspalidium distans*	Shot grass	LC	-	Native	-
Poaceae	*Paspalum dilatatum*	Dallas grass	-	-	Non-native	-
Poaceae	*Setaria sphacelata*	South African pigeon grass	-	-	Non-native	-
Poaceae	*Sporobolus creber*	Slender rat's tail grass	LC	-	Native	-
Poaceae	*Sporobolus elongatus*	Hairy grass	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Poaceae	*Sporobolus natalensis*	Giant rat's tail grass	-	-	Non-native	-
Poaceae	*Themeda triandra*	Kangaroo grass	LC	-	Native	-
Poaceae	*Tragus australianus*	Burr grass	LC	-	Native	-
Poaceae	*Urochloa mutica*	Para grass	LC	-	Native	-
Poaceae	*Bothriochloa bladhii*	Forest bluegrass	LC	-	Native	-
Polygalaceae	*Persicaria attenuata*	Knotweed	LC	-	Native	-
Polygalaceae	*Persicaria decipens*	Slender knotweed	LC	-	Native	-
Polygalaceae	*Persicaria orientalis*	-	LC	-	Native	-
Pontederiaceae	*Eichhornia crassipes*	Water hyacinth	-	-	Non-native	Category 3
Portulacaceae	*Portulaca australis*	Portulaca	LC	-	Native	-
Portulacaceae	*Portulaca pilosa*	Hairy portulaca	LC	-	Native	-
Proteaceae	*Grevillea robusta*	Silky oak	LC	-	Native	-
Protecaceae	*Persoonia sericea*	Silky geebung	LC	-	Native	-
Rhamnaceae	*Alphitonia excelsa*	Soap tree	LC	-	Native	-
Santalaceae	*Exocarpos cupressiformis*	Native cherry	LC	-	Native	-
Sapindaceae	*Alectryon diversifolius*	Scrub boonaree	LC	-	Native	-
Sapindaceae	*Alectryon tomentosus*	Hairy birds eye	LC	-	Native	-
Sapindaceae	*Atalaya hemiglauca - Incidental*	Whitewood	LC	-	Native	-
Sapindaceae	*Cardiospermum grandiflorum*	Balloon vine	-	-	Non-native	Category 3
Sapindaceae	*Cupaniopsis parvifolia*	Small-leaved tuckeroo	LC	-	Native	-
Sapindaceae	*Dodonaea triquetra*	Large-leaved hop bush	LC	-	Native	-
Sapindaceae	*Jagera pseudorhus var. pseudorhus*	Pinkfoam bark	LC	-	Native	-
Scrophulariaceae	*Eremophila debilis*	Winter apple	LC	-	Native	-
Scrophulariaceae	*Myoporum acuminatum*	Coastal boobialla	LC	-	Native	-
Smilacaceae	*Smilax australis*	Barbed-wire vine	LC	-	Native	-
Solanaceae	*Datura ferox*	Thorn apple	-	-	Non-native	-
Solanaceae	*Solanum mauritianum*	Wild tobacco	-	-	Non-native	-
Solanaceae	*Solanum torvum*	Devil's fig	-	-	Non-native	-
Sparrmanniaceae	*Grewia latifolia*	Dysentery plant	LC	-	Native	-
Sterculiaceae	*Brachychiton populneus*	Kurrajong	SLC	-	Native	-
Typhaceae	*Typha orientalis*	Broad-leaved cumbungi	LC	-	Native	-
Ulmaceae	*Aphananthe philippinensis*	Rough-leaved elm	LC	-	Native	-
Ulmaceae	*Celtis sinensis*	Chinese elm	-	-	Non-native	Category 3
Verbenaceae	*Glandularia aristigera*	Mayne's pest	-	-	Non-native	-
Verbenaceae	*Lantana camara*	Lantana	-	-	Non-native	Category 3

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Verbenaceae	*Lantana montevidensis*	Creeping lantana	-	-	Non-native	Category 3
Verbenaceae	*Phyla canescens*	Lippia	-	-	Non-native	-
Verbenaceae	*Verbena litoralis var. litoralis*	A herb	-	-	Non-native	-
Vitaceae	*Clematicissus opaca*	Pepper vine	LC	-	Native	-
Xanthorrhoeaceae	*Xanthorrhoea johnsonii*	Johnson's grass tree	SLC	-	Native	-

Restricted matters (weeds) identified within the ecology study area

Scientific name	Common name	Biosecurity category – invasive biosecurity matter	WoNS	Relative abundance categories (C2K)
Ambroosia artemislfolia	Annual ragweed	Category 3	No	Occasional to common occurrence
Anredera cordifolia	Madeira vine	Category 3	Yes	Present (EMM)
Asparagus africanus	Climbing asparagus fern	Category 3	Yes	Occasional to common occurrence
Asparagus asparagoides	Bridal creeper	Category 3	Yes	Scattered presence
Baccharis halimifolia	Groundsel bush	Category 3	No	Occasional to common occurrence
Bryophyllum delagoense	Mother of millions	Category 3	No	Occasional to severe infestation
Celtis sinensis	Chinese celtis	Category 3	No	Occasional to common occurrence
Lantana camara	West Indian lantana	Category 3	Yes	Occasional to severe infestation
Lantana montevidensis	Creeping lantana	Category 3	No	Occasional to severe infestation
Lycium ferocissimum	African boxthorn	Category 3	No	Occasional to common occurrence
Opuntia aurantiaca	Tiger pear	Category 3	Yes	Occasional
Opuntia dillenii	Prickly pear	Category 3	Yes	Occasional to scattered occurrence
Opuntia stricta	Prickly pear	Category 3	Yes	Occasional to scattered occurrence
Opuntia tomentosa	Velvety tree pear	Category 3	Yes	Occasional to common occurrence
Parthenium hysterophorus	Parthenium	Category 3	Yes	Present
Salvinia molesta	Salvinia	Category 3	Yes	Present (EMM 2019)
Schinus terebinthifolius	Broadleaved peppertree	Category 3	No	Occasional occurrence
Senecio madagascariensis	Fireweed	Category 3	Yes	Occasional to scattered occurrence
Sporobolous pyrmandi	Giant rats tail grass	Category 3	Yes	ELA (2019)

Scientific name	Common name	Biosecurity category – invasive biosecurity matter	WoNS	Relative abundance categories (C2K)
Tecoma stans	Yellow bells	Category 3	No	Present (EMM 2019)
Vachellia nilotica	Prickly acacia	Category 3	Yes	Occasional to common occurrence

APPENDIX J

Terrestrial and Aquatic Ecology Technical Report

Appendix F Fauna Species List

CALVERT TO KAGARU ENVIRONMENTAL IMPACT STATEMENT

IR_1381

Fauna species recorded during Autumn 2016 GHD and Spring 2017 FFJV field assessments undertaken as part of the project EIS

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped thornbill	LC	-	Native	-
Acanthizidae	*Acanthiza nana*	Yellow thornbill	LC	-	Native	-
Acanthizidae	*Acanthiza pusilla*	Brown thornbill	LC	-	Native	-
Acanthizidae	*Acanthiza reguloides*	Buff-rumped thornbill	LC	-	Native	-
Acanthizidae	*Gerygone albogularis*	White-throated gerygone	LC	-	Native	-
Acanthizidae	*Gerygone fusca*	Western gerygone	LC	-	Native	-
Acanthizidae	*Gerygone olivacea*	*erygone	LC	-	Native	-
Acanthizidae	*Pyrrholaemus sagittatus*	Specked warbler	LC	-	Native	-
Acanthizidae	*Sericornis frontalis*	White-browed scrubwren	LC	-	Native	-
Acanthizidae	*Smicrornis brevirostris*	Weebill	LC	-	Native	-
Accipitridae	*Accipiter fasciatis*	Brown goshawk	LC	-	Native	-
Accipitridae	*Aquila audax*	Wedge-tailed eagle	LC	-	Native	-
Accipitridae	*Aviceda subcristata*	Pacific baza	LC	-	Native	-
Accipitridae	*Haliaeetus leucogaster*	White-bellied sea-eagle	LC	-	Native	-
Accipitridae	*Haliastur sphenurus*	Whistling kite	LC	-	Native	-
Aegothelidae	*Aegotheles chrisoptus*	Australian owlet-nightjar	LC	-	Native	-
Agamidae	*Physignathus lesueurii*	Eastern water dragon	LC	-	Native	-
Agamidae	*Pogona barbata*	Bearded dragon	LC	-	Native	-
Ambassidae	*Ambassis agassizii*	Agassiz's glass fish	LC	-	Native	-
Anatidae	*Anas castanea*	Chestnut teal	LC	-	Native	-
Anatidae	*Anas gracilis*	Grey teal	LC	-	Native	-
Anatidae	*Chenonetta jubata*	Australian wood duck	LC	-	Native	-
Anatidae	*Cygnus atratus*	Black swan	LC	-	Native	-
Anhingidae	*Anhinga novaehollandiae*	Australasian darter	LC	-	Native	-
Ardeidae	*Ardea alba modesta*	Eastern great egret	SLC	-	Native	-
Ardeidae	*Ardea ibis*	Cattle egret	LC	Marine	Native	-
Ardeidae	*Ardea pacifica*	White-necked heron	LC	-	Native	-
Ardeidae	*Egretta novaehollandiae*	White-faced heron	LC	-	Native	-
Artamidae	*Artamus cinereus dealbatus*	Black-faced woodswallow	LC	-	Native	-
Artamidae	*Artamus leucorynchus*	White-breasted woodswallow	LC	-	Native	-
Artamidae	*Artamus personatus*	Masked woodswallow	LC	-	Native	-
Artamidae	*Artamus superciliosus*	White-browed woodswallow	LC	-	Native	-
Artamidae	*Cracticus nigrogularis*	Pied butcherbird	LC	-	Native	-
Artamidae	*Cracticus tibicen*	Australian magpie	LC	-	Native	-
Artamidae	*Cracticus torquatus*	Grey butcherbird	LC	-	Native	-
Artamidae	*Strepera graculina*	Pied butcherbird	LC	-	Native	-
Artamidae	*Strepera graculina graculina*	Pied currawong	LC	-	Native	-
Boidae	*Morelia spilota*	Carpet python	LC	-	Native	-
Bufonidae	*Rhinella marina*	Cane toad	-	-	Non-native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Cacatuidae	*Cacatua galerita*	Sulphur-crested cockatoo	LC	-	Native	-
Cacatuidae	*Cacatua tenuirostris*	Long-billed corella	LC	-	Native	-
Cacatuidae	*Calyptorhynchus lathami*	Glossy black-cockatoo (ort)	V	-	Native	-
Cacatuidae	*Eolophus roseicapillus*	Galah	LC	-	Native	-
Campephagidae	*Coracina lineata*	Barred cuckoo-shrike	LC	-	Native	-
Campephagidae	*Coracina novaehollandiae*	Black-faced cuckoo-shrike	LC	-	Native	-
Campephagidae	*Coracina papuensis*	White-bellied cuckoo-shrike	LC	-	Native	-
Canidae	*Canis lupus familiaris*	Dog (den)	-	-	Non-native	Category 3
Canidae	*Vulpes vulpes*	Red fox (den)	-	-	Non-native	Category 3
Caprimulgidae	*Eurostopodus argus*	Spotted nightjar	LC	-	Native	-
Charadriidae	*Vanellus miles*	Masked lapwing	LC	-	Native	-
Charadriidae	*Vanellus tricolor*	Banded lapwing	LC	-	Native	-
Cisticolidae	*Cisticola exilis*	Golden-headed cisticola	LC	-	Native	-
Climacteridae	*Cormobates leucophaea*	White-throated treecreeper	LC	-	Native	-
Columbidae	*Geopelia humeralis*	Bar-shouldered dove	LC	-	Native	-
Columbidae	*Geopelia placida*	Peaceful dove	LC	-	Native	-
Columbidae	*Ocyphaps lophotes*	Crested pigeon	LC	-	Native	-
Columbidae	*Phaps chalcoptera*	Common brownzewing	LC	-	Native	-
Corvidae	*Corvus coronoides*	Australian raven	LC	-	Native	-
Corvidae	*Corvus orru*	Torresian crow	LC	-	Native	-
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed cuckoo	LC	-	Native	-
Cuculidae	*Cacomantis variolosus*	Brush cuckoo	LC	-	Native	-
Cuculidae	*Calcites lucidus*	Shining bronze-cuckoo	LC	-	Native	-
Cuculidae	*Centropus phasianinus*	Pheasant coucal	LC	-	Native	-
Cuculidae	*Chrysococcyx basalis*	Horsfield's bronze-cuckoo	LC	-	Native	-
Dasyuridae	*Antechinus flavipes*	Yellow-footed antechinus	LC	-	Native	-
Dicruridae	*Dicrurus bracteatus bracteatus*	Spangled drongo (eastern Australia)	LC	-	Native	-
Dicruridae	*Rhipidura rufifrons*	Rufous fantail	SLC	Migratory	Native	-
Elapidae	*Pseudechis porphyriacus*	Red-bellied black snake	LC	-	Native	-
Elapidae	*Pseudonaja textilis*	Eastern brown snake	LC	-	Native	-
Eleotridae	*Hypseleotris galii*	Fire-tail gudgen	LC	-	Native	-
Eleotridae	*Hypseleotris klunzingeri*	Western carp gudgeon	LC	-	Native	-
Estrildidae	*Neochmia temporalis*	Red-browed finch	LC	-	Native	-
Estrildidae	*Taeniopygia bichenovii*	Double-barred finch	LC	-	Native	-
Falconidae	*Falco cenchroides*	Nankeen kestrel	LC	-	Native	-
Falconidae	*Falco peregrinus*	Peregrine falcon	LC	-	Native	-
Gekkonidae	*Gehyra dubia*	Dubious dtella	LC	-	Native	-
Halcyonidae	*Dacelo novaeguineae*	Laughing kookaburra	LC	-	Native	-
Hirundinidae	*Hirundo neoxena*	Welcome swallow	LC	-	Native	-
Hirundinidae	*Petrochelidon nigricans*	Tree martin	LC	-	Native	-
Hylidae	*Litoria caerulea*	Green tree frog	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Hylidae	*Litoria latoppalmata*	Broad-palmed rocket frog	LC	-	Native	-
Hylidae	*Litoria peronii*	Emerald-spotted tree frog	LC	-	Native	-
Jacanidae	*Irediparra gallinacea*	Comb-crested jacana	LC	-	Native	-
Laridae	*Hydroprogne caspia*	Caspian tern	SLC	-	Native	-
Leporidae	*Lepus europaeus*	European brown hare	-	-	Non-native	Category 3
Leporidae	*Oryctolagus cuniculus*	European rabbit	-	-	Non-native	Category 3
Macropodiae	Macropod	Macropod (scats)	LC	-	Native	-
Macropodidae	*Macropus giganteus*	Eastern grey kangaroo	LC	-	Native	-
Macropodidae	*Macropus parryi*	Whiptail wallaby	LC	-	Native	-
Macropodidae	*Macropus rufogriseus*	Red-necked wallaby	LC	-	Native	-
Maluridae	*Malurus cyaneus*	Superb fairy-wren	LC	-	Native	-
Maluridae	*Malurus lamberti*	Variegated fairy-wren	LC	-	Native	-
Maluridae	*Malurus melanocephalus*	Red-backed fairy-wren	LC	-	Native	-
Meliphagidae	*Entomyzon cyanotis*	Blue-faced honeyeater	LC	-	Native	-
Meliphagidae	*Lichenostomus chrysops*	Yellow-faced honeyeater	LC	-	Native	-
Meliphagidae	*Lichenostomus pencillatus*	White-plumed honeyeater	LC	-	Native	-
Meliphagidae	*Lichenostomus virescens*	Singing honeyeater	LC	-	Native	-
Meliphagidae	*Lichmera indistincta*	Brown honeyeater	LC	-	Native	-
Meliphagidae	*Manorina melanocephala*	Noisy miner	LC	-	Native	-
Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater	LC	-	Native	-
Meliphagidae	*Melithreptus albogularis*	White-throated honeyeater	LC	-	Native	-
Meliphagidae	*Myzomela sanguinolenta*	Scarlet honeyeater	LC	-	Native	-
Meliphagidae	*Nesoptilotis leucotis*	White-eared honeyeater	LC	-	Native	-
Meliphagidae	*Philemon citreogularis*	Little friarbird	LC	-	Native	-
Meliphagidae	*Philemon corniculatus*	Noisy friarbird	LC	-	Native	-
Meliphagidae	*Plectorhyncha lanceolata*	Striped honeyeater	LC	-	Native	-
Meropidae	*Merops ornatus*	Rainbow bee-eater	LC	Marine	Native	-
Miniopteridae	*Miniopterus australis*	Little bent-winged bat	LC	-	Native	-
Miniopteridae	*Miniopterus orianae oceanensis*	Eastern bent-winged bat	LC	-	Native	-
Molossidae	*Austronomus australis*	White-striped freetail bat	LC	-	Native	-
Monarchidae	*Grallina cyanoleuca*	Magpie-lark	LC	-	Native	-
Monarchidae	*Myiagra inquieta*	Restless flycatcher	LC	-	Native	-
Monarchidae	*Myiagra rubecula*	leaden flycatcher	LC	-	Native	-
Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	LC	-	Native	-
Muridae	*Rattus rattus*	Black rat	-	-	Non-native	-
Myobatrachidae	*Crinia sp*	Frog	LC	-	Native	-
Nectariniidae	*Dicaeum hirundinaceum*	Mistletoebird	LC	-	Native	-
Neosittidae	*Daphoenositta chrysoptera*	Varied sittella	LC	-	Native	-
Oriolidae	*Oriolus sagittatus*	Olive-backed oriole	LC	-	Native	-
Pachycephalidae	*Colluricincla harmonica*	Grey shrike-thrush	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Pachycephalidae	*Colluricincla megarhyncha*	Little shrike-thrush	LC	-	Native	-
Pachycephalidae	*Pachydephala rufiventris*	Rufous whistler	LC	-	Native	-
Pardalotidae	*Pardalotus punctatus*	Spotted pardalote	LC	-	Native	-
Pardalotidae	*Pardalotus striatus*	Striated pardalote	LC	-	Native	-
Peramelidae	*Isoodon macrourus*	Northern brown bandicoot	LC	-	Native	-
Permelidae	*Isoodon* sp	Bandicoot (diggings)	LC	-	Native	-
Petauridae	*Petaurus norfolcensis*	Squirrel glider	LC	-	Native	-
Petauride	*Petaurus* sp	Glider (scratches)	LC	-	Native	-
Petroicidae	*Eopsaltria australis*	Eastern yellow robin	LC	-	Native	-
Petroicidae	*Microeca fascinans*	Jacky winter	LC	-	Native	-
Petroicidae	*Petroica rosea*	Rose robin	LC	-	Native	-
Petroicidae	*Tregellasia capito*	Pale yellow robin	LC	-	Native	-
Phalacrocoracidae	*Phalacrocorax melanoleucos*	Little pied commorant	LC	-	Native	-
Phalangeridae	*Trichosurus vulpecula*	Common brushtail possum (scat)	LC	-	Native	-
Phascolarctidae	*Phascolarctos cinereus*	Koala	V	V	Native	-
Podargidae	*Podargus strigoides*	Tawny frogmouth	LC	-	Native	-
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe	LC	-	Native	-
Poeciliidae	*Gambusia holbrooki*	Mosquito fish	-	-	Non-native	Category 3
Psittacidae	*Alisterus scapularis*	Australian king-parrot	LC	-	Native	-
Psittacidae	*Trichoglossus chlorolepidotus*	Scaly-breasted lorikeet	LC	-	Native	-
Psittacidae	*Trichoglossus haematodus moluccanus*	Rainbow lorikeet	LC	-	Native	-
Psittaculidae	*Glossapsitta pusilla*	Little lorikeet	LC	-	Native	-
Psittaculidae	*Neophema pulchella*	Turquoise parrot	LC	-	Native	-
Psittaculidae	*Platycercus adscitus*	Pale-headed rosella	LC	-	Native	-
Psophodidae	*Psophodes olivaceus*	Eastern whipbird	LC	-	Native	-
Rallidae	*Fulica atra*	Eurasian coot	LC	-	Native	-
Rallidae	*Gallinula tenebrosa*	Dusky moorhen	LC	-	Native	-
Recurvirostridae	*Cladorhynchus leucocephalus*	Banded stilt	LC	-	Native	-
Rhinolophidae	*Rhinolophus megaphyllus*	Southern horseshoe bat	LC	-	Native	-
Rhipiduridae	*Rhipidura albiscapa*	Grey fantail	LC	-	Native	-
Rhipiduridae	*Rhipidura leucophrys*	Willie wagtail	LC	-	Native	-
Scincidae	*Carlia pectoralis*	Open-litter rainbow skink	LC	-	Native	-
Scincidae	*Carlia vivax*	Lively skink	LC	-	Native	-
Scincidae	*Cryptoblepharus australis*	Inland snake-eyed skink	LC	-	Native	-
Scincidae	*Cryptoblepharus pulcher*	Wall skink	LC	-	Native	-
Scincidae	*Ctenotus taeniolatus*	Eastern copper-tailed skink	LC	-	Native	-
Scincidae	*Eulamprus martini*	Dark bar-sided skink	LC	-	Native	-

Family	Species name	Common name	Conservation status		Native/ non-native	Restricted matter
			NC Act	EPBC Act		
Scincidae	*Eulamprus quoyii*	Eastern water-skink	LC	-	Native	-
Scincidae	*Lampropholis delicata*	Grass skink	LC	-	Native	-
Scincidae	*Lygisaurus foliorum*	Iridescent litter skink	LC	-	Native	-
Scincidae	*Morethia taeniopleura*	Fire-tailed skink	LC	-	Native	-
Strigidae	*Ninox novaeseelandiae*	Southern boobook	LC	-	Native	-
Suidae	*Sus scrofa*	Pig (scats)	-	-	Non-native	Category 3
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked echidna (diggings and scats)	SL	-	Native	-
Terapontidae	*Leiopotherapon unicolor*	Spangled perch	LC	-	Native	-
Threskiornithidae	*Plegadis falcinellus*	Glossy ibis	SLC	Migratory	Native	-
Threskiornithidae	*Threskiornis molucca*	Australian white ibis	LC	-	Native	-
Threskiornithidae	*Threskiornis spinicollis*	Straw-necked ibis	LC	-	Native	-
Timaliidae	*Zosterops lateralis cornwalli*	Silvereye (eastern)	LC	-	Native	-
Varanidae	*Varanus varius*	Lace monitor	LC	-	Native	-
Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat	LC	-	Native	-
Vespertilionidae	Chalinolobus nigrogriseus	Hoary bat	LC	-	Native	-
Zosteropidae	*Zosterops lateralis*	Silvereye	LC	-	Native	-